DOCUMENT RESUME

ED 403 331 TM 026 391

AUTHOR	Matheson, Nancy; And Others
TITLE	Education Indicators: An International Perspective.
INSTITUTION	National Center for Education Statistics (ED), Washington, DC.; Pelavin Research Inst., Washington, DC.
REPORT NO	NCES-96-003
PUB DATE	Nov 96
NOTE	321p.
PUB TYPE	Reports - Evaluative/Feasibility (142) -- Statistical Data (110)
EDRS PRICE	MF01/PC13 Plus Postage.
DESCRIPTORS	*Academic Achievement; Comparative Analysis; Context Effect; Cross Cultural Studies; *Developed Nations; *Educational Finance; Education Work Relationship; *Elementary Secondary Education; Financial Support; Foreign Countries; Geography; Higher Education; International Education; International Studies; Mathematics; *Performance Factors; Reading; Sciences; Student Characteristics
IDENTIFIERS	*Educational Indicators; *International Educational Indicators

ABSTRACT

This publication compiles a comprehensive set of educational indicators using data from a variety of sources and presents results of interest to a U.S. audience about education in the United States and other countries. International indicators provide the United States with an opportunity to compare its performance with that of other countries, to identify areas for improvement, and to suggest new approaches to producing a world-class class educational system. The report presents data on many countries, but the primary comparisons are among the Group of Seven (G-7) countries, seven industrialized nations with large economies: Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. The achievement indicators show that the performance of U.S. students is mixed. They perform well in reading in comparison with their peers in other countries, and less well in geography and science. Their weakest area relative to students in other countries is mathematics. The finance indicators presented in this publication show that public financial investment in education in the United States is among the highest of the G-7 countries on multiple measures. Indicators are divided into: (1) Participation and Student Flows; (2) Achievement and Attainment; (3) Education and Labor Market Destinations; (4) Contextual Factors; and (5) Societal Support for Education. (Contains 45 tables, 45 figures, and 15 references.) (SLD)

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Education Indicators

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Education Indicators

An International Perspective

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November 1996

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November 1996

Suggested Citation

U.S. Department of Education. National Center for Education Statistics. *Education Indicators: An International Perspective*, NCES 96–003, by Nancy Matheson, Laura Hersh Salganik, Richard P. Phelps, Marianne Perie, Nabeel Alsalam, and Thomas M. Smith. Washington, DC: 1996.

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FOREWORD

The need to compete in foreign markets with advanced technology has convinced U.S. business, economic, and political leaders of the importance of understanding the education systems of other industrialized nations. The awareness of how other countries educate their citizens provides insight into the competitiveness of those nations, and it provides a benchmark with which to compare our own education system.

Education Indicators: An International Perspective expands on the traditional interest in student achievement and education finance by including a broad range of indicators, such as "Gender differences in earnings," "Time spent on homework," and "Home and school language," among others. The indicators focus primarily upon comparisons between the United States and other industrialized nations with large economies—particularly those that most closely resemble the United States in terms of size and are viewed as our major economic competitors.

Among a multitude of sources used in this report, the most comprehensive is *Education at a Glance* (1995), the international education indicators report produced by the Organization for Economic Cooperation and Development (OECD). Other data sources include the International Assessment of Educational Progress, the International Association for the Evaluation of Educational Achievement, and the International Assessment of Adult Literacy.

The importance of *Education Indicators: An International Perspective* lies in its ability to provide a comprehensive selection of international indicators geared toward a U.S. audience. This particular set of indicators is presented together for the first time and much of the data are derived from sources not readily accessible to U.S. readers. The publication, then, contributes to the continuing effort to make comparative information accessible and useful to U.S. leaders.

Jeanne E. Griffith, Associate Commissioner
National Center for Education Statistics

ACKNOWLEDGMENTS

Education Indicators: An International Perspective was authored by a joint National Center for Education Statistics (NCES)/Pelavin Research Institute (PRI) team under the general direction of Thomas M. Smith of the Data Development and Longitudinal Studies Group. Overall direction was provided by Nabeel Alsalam, Director of the Special Studies and Reports Program.

The authors wish to thank all of those who contributed to the production of this report. Special thanks go to Diedra White at PRI who provided valuable contributions to the production of this publication from its conception to end. We'd also like to acknowledge the staff at EEI, including Amy Lenihan, Kathryn Hall, and Kim Agnew, who were responsible for the final design and layout of the publication as well as its preparation for printing. Finally, we'd like to recognize Norberto Bottani from the Organization for Economic Cooperation and Development (OECD) for his key role in the International Indicators of Education Systems (INES) project, from which many of this publication's indicators originated.

Numerous staff from PRI—Tsze Chan, Bing Deng, Erin Sheehan, Maria Stephens, Scott Brancolini, and Jack Easton—made important contributions to the preparation of this report. Joel Sherman and Jay Moskowitz provided helpful comments on the draft manuscript. From the American Institutes for Research (AIR), David Baker wrote the sidebar entitled *Similarities among national education systems*, Keith Tidman coordinated the final layout and production of the publication, and Sally Dillow edited the final draft of the manuscript.

Many thanks are due to NCES staff, whose contributions range from providing general direction at the beginning of the project to helping resolve specific issues along the way. In particular, we would like to thank Sue Ahmed, Marilyn Binkley, Mary Frase, Jeanne Griffith, Marilyn McMillen, Eugene Owen, Lois Peak, and Thomas Snyder for their help.

Several individuals served as invited external peer reviewers of the draft manuscript. These reviewers offered many insightful comments. The peer reviewers were Dorothy Gilford, former Staff Director of the Board on International Comparative Studies in Education of the National Academy of Sciences; Howard Nelson, American Federation of Teachers; Delia Pompa, U.S. Department of Education, Office of the Director for Bilingual Education and Minority Language Affairs; Diane Ravitch, New York University; and Edith M. Rasel, Economic Policy Institute.

Lastly, thanks are due to our colleagues in the G-7 countries who reviewed the matrices of comparative information on countries' education systems for accuracy, and to many others who have generously shared their time and knowledge to help us better understand their countries' education systems.

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INTRODUCTION

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INTRODUCTION

U.S. business leaders, policymakers, and researchers have expressed great interest in understanding how the U.S. education system compares with those of other countries. *Why is so much importance placed on international comparisons?* Simply stated, understanding others helps us to better understand ourselves. International indicators provide the United States with the opportunity to compare its performance with that of other countries, to identify similarities and differences between our system and others, and to suggest new approaches to the challenge of providing a world-class education in the United States.

While this publication provides data on many countries, the primary comparisons are among the *Group of Seven* or G–7 countries. These are seven industrialized nations with large economies: Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. Comparisons between the United States and other G–7 countries are generally more informative than comparisons with other countries, as the G–7 countries are more similar to the United States in terms of size and are viewed as our major economic competitors.

Cross-country comparisons in education have focused on indicators of achievement and of finance. A prime example is the attention devoted to international comparisons of student achievement. The information that these comparisons provide about the performance of students in other countries is valuable to U.S. educators as they work toward establishing high standards for U.S. student achievement. Similarly, information about other countries' financial investment in education is of interest to U.S. policymakers.

This publication presents a wide range of indicators, including several in both of these key areas. The achievement indicators show that the performance of U.S. students is mixed; they perform well in comparison with their peers in other countries in reading and less well in geography and science. Their weakest area relative to students in other countries is mathematics. (For more information about student performance, see the section entitled *Achievement and Attainment.*) The finance indicators presented in this publication show that public financial investment in education in the United States is among the highest of the G–7 countries on multiple measures. (For more information about education finance, see the section entitled *Societal Support for Education.*)

Purpose and Goals of This Publication

The purpose of this publication is to expand the discussion of education indicators in three key ways:

- Compiling a comprehensive set of indicators using information from a variety of sources;
- Presenting results that are of interest to a U.S. audience; and
- Providing the reader with background information on the education systems of both the United States and its economic competitors to aid in the interpretation of indicators.

Comprehensive set of indicators

International education indicators are available from a number of sources, but many of these sources are not readily accessible to U.S. readers; we have compiled a large collection of these indicators for use in this publication. No other U.S. publication to date provides as comprehensive a selection of international indicators related to education.

Presentation geared to the U.S. audience

Whereas publications prepared by international groups are careful not to focus on any one country, this publication presents indicators and results geared to a U.S. audience. For example, decisionmaking in education is an area of policy interest in the United States. In the United States, the local level plays a key role in education decisionmaking and includes the school level in the decisionmaking process by consulting with the school on many decisions. The presentation of the indicator on decisionmaking highlights the finding that no other country relies more heavily on local-level decisionmaking or includes consultation with those at the school level to the extent that the United States does (for details, see Indicator 20).

Background information

Countries' education systems and societies operate differently in many important ways, and awareness of these differences has a bearing on the interpretation of the indicators. The intent of this publication is to provide everyone—including policymakers, business people, researchers, and concerned citizens—with both the data and the contextual information that they need to make informed judgments about the successes and failures of the U.S. education system.

Education Indicators: An International Perspective provides readers with relevant material about the education systems and social structures of other countries, specifically designed for readers who are knowledgeable about the United States. To illustrate, in spite of the fact that there is an international system for classifying levels of education (International Standard Classification of Education [ISCED]), schools in different countries that are classified at the same

ISCED level may not provide the same programs or have the same functions. In the United States, for example, nurses receive their qualifying training in post–high school vocational training programs, nonbaccalaureate higher education programs, or baccalaureate programs. Comparable training in other countries rarely takes place in baccalaureate programs. In Austria and Germany, for instance, nurse training takes place at institutions classified as upper secondary school level (the level at which U.S. high schools are classified) in full-time nurse training schools. Upper-secondary-level apprenticeship and vocational programs in several countries, including Germany and Austria, provide the type of specialized occupational training that in the United States does not take place until after high school. Interpreting student enrollment rates at different levels of education requires an understanding of these differences. (For further information, see sidebars entitled *ISCED levels of education* and *Differences in programs offered across education levels.*)

Throughout this publication, background information is interspersed with the indicators, appearing in overviews that introduce sections of indicators and in sidebars. It is only with this background that the reader can fully understand the meaning of the indicators. In addition, a separate section at the back of the publication provides comparative descriptions of education systems, along with technical notes and other reference materials.

Structure of This Publication

This publication presents:

- 45 education indicators, grouped by topic into six sections, with critical background information incorporated into each section; and
- additional reference material at the back of the publication.

The individual indicators

With few exceptions, each indicator includes:

- one page of text, which consists of an introductory paragraph that explains the indicator's significance, followed by bulleted items that summarize key findings;
- one or more tables, which summarize the data in a tabular format; and
- one or more figures (usually line graphs, bar charts, or pie charts), which summarize the data in a graphical format.

In addition, sidebars accompany several of the indicators. The sidebars provide explanatory material to help readers better understand the context surrounding certain indicators, so that readers can interpret these indicators more accurately.

The indicators are divided into the following sections:

- *Participation and Student Flows*,
- *Achievement and Attainment*,
- *Education and Labor Market Destinations*,
- *Education Institutions*,
- *Contextual Factors*, and
- *Societal Support for Education*.

Each section begins with an overview, which summarizes key results and introduces selected information from the sidebars and from the reference sections at the back of the publication.

Reference material

At the back of the publication, four separate sections provide additional information:

- *Matrices of Comparative Information on Countries' Education Systems.* Four matrices (that is, text tables) provide a comparative description of the education systems of the G–7 countries. The matrices cover the following topics:
    - Curriculum standards,
    - Entrance and exit examinations,
    - Teacher training and certification requirements, and
    - Structure and governance of education systems.
- *Supplemental Notes and Tables.* Notes provide an explanation of technical or data-related issues. In some instances, tables also provide additional details on a topic. Individuals who are interested in using these data for research or policy purposes should pay special attention to this section.
- *Sources of Data.* Brief descriptions provide key information about each data source.
- *Glossary.* Definitions explain terms that may be unfamiliar to the reader.

INDICATORS

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PARTICIPATION AND STUDENT FLOWS

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The supply of formal education is a primary concern of the United States, as it is for most other countries. Nations have increasingly turned to formal education for a number of political and economic purposes, including the training of a competitive labor force and the reduction of social problems.[1] Indeed, policymakers around the world have actively embraced the notion that a highly educated citizenry is vital to a country's economic success.[2]

While the United States does not stand out on measures of compulsory schooling or overall enrollment in formal education, its rate of participation in noncompulsory education (preprimary, high school, and higher education) differed from many of the G–7 countries.

In 1992, the enrollment of 5- to 29-year-olds in formal education in the United States was in the mid-range of enrollment in the G–7 countries—54 students enrolled per 100 5- to 29-year-olds. In all of the G–7 countries except Italy, approximately 60–67 percent of enrollment was in primary and lower secondary education (Indicator 1).

Early childhood education

Approximately 29 percent of 3-year-olds in the United States were enrolled in early childhood education in 1992. Corresponding rates for 3-year-olds in the G–7 countries ranged from 23 percent in Japan to 99 percent in France (Indicator 2). Structural differences in early childhood education systems help to explain these differences. For instance, in the United States, children begin early childhood education as early as age 3, although it is not until age 5 that the vast majority of children are enrolled. In many other countries, children typically begin early childhood education at different ages (e.g., age 2 in France and Belgium, age 4 in the Netherlands, and age 5 in Switzerland).

Differential enrollment rates also stem from cross-country differences in how early childhood education is defined and how data are collected. To illustrate, some countries only reported education programs in their measure of early childhood education, while others also included programs that focused primarily on physical and social development. The United States reported only enrollments in schools or other educational institutions.

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[1] J. Meyer, F. Ramirez, R. Rubinson, and J. Boli-Bennet, "The World Educational Revolution, 1950–70," in *National Development and the World System, Educational, Economic, and Political Change, 1950–70*, ed. J. Meyer and M. Hannan (Chicago: University of Chicago Press, 1979).

[2] U.S. Department of Labor, Secretary's Commission on Achieving Necessary Skills, *Learning a Living* (Washington, D.C.: 1992).

Compulsory education

Since the 1960s, there has been a persistent increase in the proportion of children attending formal schooling, especially at the elementary, middle/junior high, and high school levels. Enrollment at these levels is almost universal in most developed countries. Since schooling at these levels is typically compulsory, it is not surprising that participation rates are almost universal for 14- to 15-year-olds (Indicator 3).

Postcompulsory education

Compulsory education ends at different ages across the G–7 countries. In the United States,[3] Canada, France, Germany, and the United Kingdom, mandatory schooling ends at age 16; the end point is age 14 in Italy and 15 in Japan. In Germany, full-time compulsory education ends at age 16, although students are required to be enrolled at least part-time through age 18. (See the matrix entitled *Structure and Governance of Education Systems in G–7 Countries.*)

After compulsory education, enrollment rates drop off, but the drop-off patterns differ in different countries. In the United States, enrollment in secondary education dropped from 72 percent for 17-year-olds to 21 percent for 18-year-olds. In contrast, the rate declined as early as age 16 in the United Kingdom, whereas several countries (e.g., the former West Germany) had a sizable percentage of 19-year-olds still enrolled in secondary education (Indicator 3).

Differences in the structure and processes inherent in the education systems of these countries help to explain the differential drop-off. The student certification processes of the United States, the United Kingdom, and Germany are a case in point. In the United States, the first opportunity for students to receive secondary certification is upon completing high school, usually at age 17 or 18. In the United Kingdom, students take the examination for the general certificate of secondary education when they are 16. Youth who do not continue to upper secondary schooling and are unemployed are eligible for training programs supported by the government but outside the education system. In Germany, the majority of secondary school students who continue after age 16 and are not preparing for university education participate in vocational training at the upper secondary level, including the country's dual system of part-time schooling and part-time apprenticeship. Because the certification offered by the dual system is a prerequisite for many fields, a significant number of students enroll in it. There are sizable upper secondary participation rates in Germany even after age 19 because students may enroll in a second upper secondary program after completing one program.

Differential enrollment and drop-off also reflect differences in the types of programs offered or classified as upper secondary or higher education. To illustrate, nursing training takes place in any variety of post–high school training programs in the United States (nonbaccalaureate and baccalaureate). In France, it occurs in nonbaccalaureate programs at schools of nursing; and in Austria and Germany, it occurs at the secondary level in full-time nurse training schools.

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[3] The end point of compulsory education also varies within the United States. In some states, mandatory schooling ends later than age 16.

Participation in higher education in the United States and Canada was among the highest in the world in 1992 (Indicator 4, Indicator 5). However, this does not mean that young adults the age of U.S. college students are more likely to be enrolled in education programs in the United States than in other countries. For example, when higher education and upper secondary education are considered together (Indicator 6), the percentage of 19-year-olds who are enrolled in education programs is higher in many countries, including France and the former West Germany, than in the United States.

One reason that young adults in the United States are among the most likely of those in the G–7 countries to pursue higher education is that the U.S. system of higher education is more accessible and less restrictive than that of many other countries. Many countries limit access to higher education through mandatory examinations or by offering a relatively small number of slots in their institutions of higher education.

Indicator 1: Enrolled Persons 5–29 Years Old

The number of students enrolled in formal education (except preprimary education[1]) per 100 persons in the population 5–29 years old provides an indication of the extent to which youth are enrolled in the education system; the percentage distribution of enrollment reflects how they are distributed across education levels. These measures are influenced by the age structure of the population 5–29 years old (i.e., the percentage in the younger portion of this age cohort) and the rate at which youth of various ages are enrolled. A high overall participation rate may reflect a high value placed on education, an economy dependent on a highly trained workforce, the availability of education institutions, or a relatively high percentage of the population 5–29 years old who are in the younger age groups that have virtually 100 percent enrollment. A high percentage of students enrolled at a particular level may reflect a relatively large cohort of the age typically attending that level or a high enrollment rate among the young people in the cohort.

- In 1992, the enrollment of 5- to 29-year-olds in the G–7 countries ranged from almost 50 per 100 persons in that age range in Germany to more than 58 per 100 in France. The U.S. enrollment ratio was in the middle, at 54 per 100 5- to 29-year-olds.
- In all of the G–7 countries, approximately 60–67 percent of enrollment was in primary and lower secondary education,[2] with the exception of Italy, where only 52 percent of all enrolled students were at the primary or lower secondary level. The share of enrolled 5- to 29-year-olds attending higher education ranged from 8 percent in the United Kingdom to 17 percent in Canada. The percentage of total enrollment in higher education in the United States (16 percent) neared that of Canada.

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[1] For the United States, preprimary includes kindergarten

[2] See the sidebar entitled *ISCED levels of education* for an explanation of education levels.

Table 1: Public and private enrollment[1] per 100 persons in the population 5–29 years of age, by country, and the percentage distribution of education enrollment, by level and country: 1992

Country	Enrollment per 100 persons (all levels)	Percentage distribution (Total = 100.0)				Schooling expectancy for a 5-year-old[2]
		Primary and lower secondary	Upper secondary	Higher education	Unclassified	
G–7						
Canada	58.0	62.8	20.0	17.4	0.0	—
France	58.4	61.3	21.1	15.4	2.2	15.9
Germany	49.8	62.4	22.1	15.5	0.0	—
Italy	50.0	52.2	32.0	15.6	0.0	—
Japan	55.7	60.3	23.7	14.0	2.0	—
United Kingdom	51.9	67.4	24.5	8.1	0.0	14.0
United States	**54.2**	**66.2**	**17.5**	**16.1**	**0.0**	**14.8**
Other						
Australia	53.3	75.4	11.6	12.9	—	—
Austria	50.5	52.9	28.7	18.4	0.0	—
Belgium	53.9	57.1	28.6	13.9	0.2	15.8
Czech Republic	51.2	63.9	29.9	6.4	0.0	—
Denmark	54.9	59.4	23.7	17.1	0.0	15.6
Finland	60.8	59.2	23.7	17.1	—	15.4
Greece	50.0	67.8	22.4	9.8	0.0	13.7
Hungary	48.7	64.5	30.8	4.7	0.0	13.2
Ireland	56.4	72.0	18.6	9.0	0.5	14.6
Netherlands	54.4	63.1	23.3	13.6	0.0	16.0
New Zealand	55.6	70.5	18.7	10.6	0.0	14.6
Norway	54.6	57.3	27.7	15.0	0.0	15.6
Poland	52.6	67.5	25.5	7.0	0.0	13.0
Portugal[3]	47.0	72.3	19.4	8.5	8.0	—
Russia	45.0	71.8	15.1	13.3	0.0	12.5
Spain	56.9	54.1	30.2	15.1	0.5	—
Sweden	50.2	63.7	21.3	14.9	0.0	14.7
Switzerland	49.1	65.2	23.8	10.2	0.6	15.2
Turkey	39.7	79.3	13.6	7.1	0.0	9.4

—Not available.

[1] Full-time equivalent.

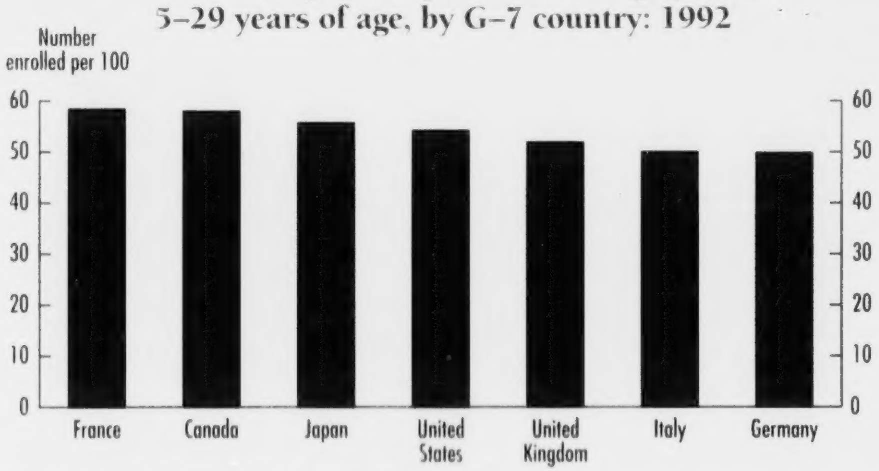
[2] The hypothetical duration of schooling for a 5-year-old child under current conditions, calculated by adding the net enrollment rate for each year of age from 5 to 29, and dividing by 100.

[3] 1991 data.

NOTE: See supplemental note to Indicator 1 for details on indicator calculation for Australia, the Czech Republic, Denmark, Hungary, Italy, Japan, Norway, Sweden, and the United States and for an explanation of the calculation of full-time equivalent enrollments.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

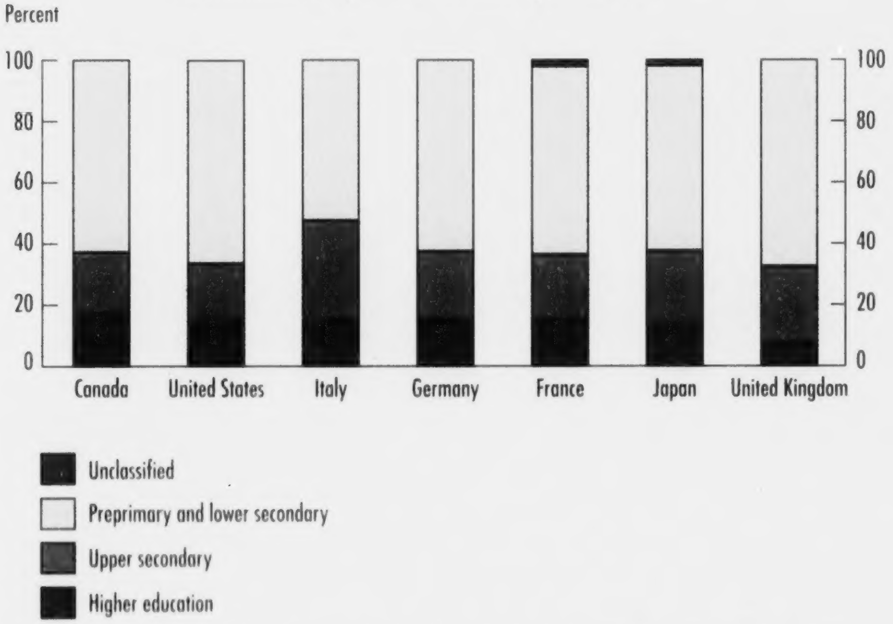
Figure 1a: Public and private enrollment in formal education per 100 persons in the population 5–29 years of age, by G–7 country: 1992



NOTE: Unclassified enrollments for France and Japan are included.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

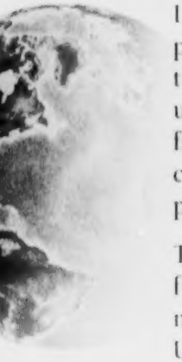
Figure 1b: Percentage distribution of education enrollment of 5- to 29-year-olds among levels of formal education, by G–7 country:* 1992



*Countries are sorted in descending order by the percentage of enrollment in higher education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

ISCED levels of education



In order to define levels of education uniformly across all countries, this publication uses terms that were developed by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and have been agreed upon by all participating countries, but which might be unfamiliar to readers from the United States. These levels, called the International Standard Classification of Education (ISCED) levels, are used to compile internationally comparable statistics on education.

The classification distinguishes between seven levels of education ranging from preprimary to tertiary. International definitions of preprimary, primary, and tertiary education are similar to the definitions used in the United States; however, lower and upper secondary education have slightly different meanings.

Preprimary education (level 0), also called early childhood education, usually includes education for children aged 3–5, although in some countries, it starts as early as age 2 and in others continues through age 6. In the United States, preprimary education includes kindergarten. Primary education (level 1) runs from about ages 6–11, or about first through sixth grades in the United States. Specialization rarely occurs in any country before secondary education.

Secondary education covers ages 11 or 12 through 18 or 19 and is divided into two levels: lower and upper secondary (levels 2 and 3). For the purposes of statistical comparability, the United States has defined lower secondary education as grades 7 through 9 and upper secondary as grades 10 through 12. In the United States, lower secondary education is the loose equivalent of intermediate school, middle school, or junior high school; however, in many other countries lower secondary education ends with an examination and constitutes the completion of compulsory education. Upper secondary education immediately follows lower secondary education and includes general (academic), technical, and vocational education, or any combination thereof, depending on the country. An upper secondary attainment level is roughly equivalent to a U.S. high school diploma.

Higher education, also referred to as tertiary education, includes three ISCED levels and is the equivalent of postsecondary education in the United States. Nonuniversity higher education includes education beyond the secondary school level involving programs (e.g., vocational, community college, and junior college programs) that terminate in less than a 4-year degree. This type of education is at ISCED level 5. ISCED level 6 comprises education programs that lead to a 4-year undergraduate degree. These programs are typically located in universities and other 4-year institutions. The highest level, ISCED level 7, includes graduate and professional degree programs.

NOTE: For the attainment indicators, a person is classified in the highest level for which they completed the *last* grade or degree for the level. For example, a U.S. student must complete grade 9 in order to attain a lower secondary education and 2 years of higher education (associate's degree) in order to attain a nonuniversity higher education.

ISCED level	Definition	U.S. equivalent
0	Preprimary	Kindergarten and below
1	Primary	1st–6th grades
2	Lower secondary	7th–9th grades
3	Upper secondary	10th–12th grades or first 3 years of vocational education
5	Nonuniversity higher education	Community or junior colleges or vocational/technical institutes (nonuniversity) leading to an associate's degree
6	University higher education (first degree)	University or other 4-year education institution (college or university) leading to a bachelor's degree
7	University higher education (advanced degree)	University or professional institute (university) leading to a master's or doctor's degree

Indicator 2: Enrollment in Early Childhood Education

The percentage of 3- to 7-year-olds who are enrolled in public and private early childhood education programs* reflects the importance of student participation in education and the availability of affordable programs. The percentage of children enrolled in early childhood education at different ages is influenced by differences in the timing of entry. A country's early childhood education enrollment rates may be influenced by the labor force participation of its females and by the prevalence of center-based or home-based care. While children may be exposed to educational opportunities in a variety of settings, this indicator only includes enrollment in center- or school-based education programs.

- In the United States, 29 percent of 3-year-olds were enrolled in an early childhood education program in 1992. In the G–7 countries for which data were available, 1992 enrollment for 3-year-olds ranged from approximately 23 percent in Japan to almost 100 percent in France.
- By age 4, over half of the children in the United States were enrolled in some form of early childhood education. In a number of countries—France, the United Kingdom, Belgium, Hungary, the Netherlands, New Zealand, and Spain—enrollment among 4-year-olds was 90 percent or higher.
- By age 6, almost all the children in every country were enrolled in an education program, with the exception of Finland (58 percent), Norway (79 percent), and Turkey (14 percent). By age 7, all countries had a net enrollment rate above 93 percent.

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*Early childhood education includes both preprimary and primary education, since there are variations in the definition of preprimary education among countries.

Table 2: Enrollment rates[1] in public and private early childhood education,[2] by age and country: 1992

Country	Percent enrolled by single year of age[3]				
	3	4	5	6	7
G-7[4]					
Canada	—	45.9	99.2	103.7	102.9
France	98.8	101.4	101.5	100.6	100.2
West Germany (former)	30.8	68.5	78.5	115.1	97.5
Japan	23.1	57.6	65.7	101.9	101.0
United Kingdom	37.0	90.1	98.9	98.5	98.9
United States	**28.5**	**53.0**	**88.6**	**102.3**	**103.3**
Other					
Austria	29.0	66.3	86.2	98.4	100.0
Belgium	97.7	99.3	99.7	99.8	99.1
Czech Republic	65.7	84.1	99.8	106.7	102.8
Denmark	37.9	53.6	61.1	96.4	99.7
Finland	24.3	28.1	32.0	57.6	99.5
Greece	11.2	48.9	85.2	102.5	95.6
Hungary	99.0	100.5	101.2	100.6	101.1
Ireland	1.2	55.7	100.0	99.1	100.5
Netherlands	0.0	98.0	98.8	97.7	100.0
New Zealand	73.7	92.6	105.1	100.8	100.9
Norway	44.0	56.5	65.1	79.3	99.3
Poland	78.3	—	—	95.0	98.5
Russia	53.9	52.0	51.6	99.3	100.0
Spain	37.2	95.8	100.4	103.2	103.8
Sweden	45.2	50.8	60.6	99.9	97.5
Switzerland	7.4	26.2	77.3	99.0	100.1
Turkey	—	0.3	1.5	14.2	93.3

—Not available due to lack of data or problems in defining preprimary education at this age.

[1] Head counts.

[2] Enrollment rates that exceed 100 reflect measurement error.

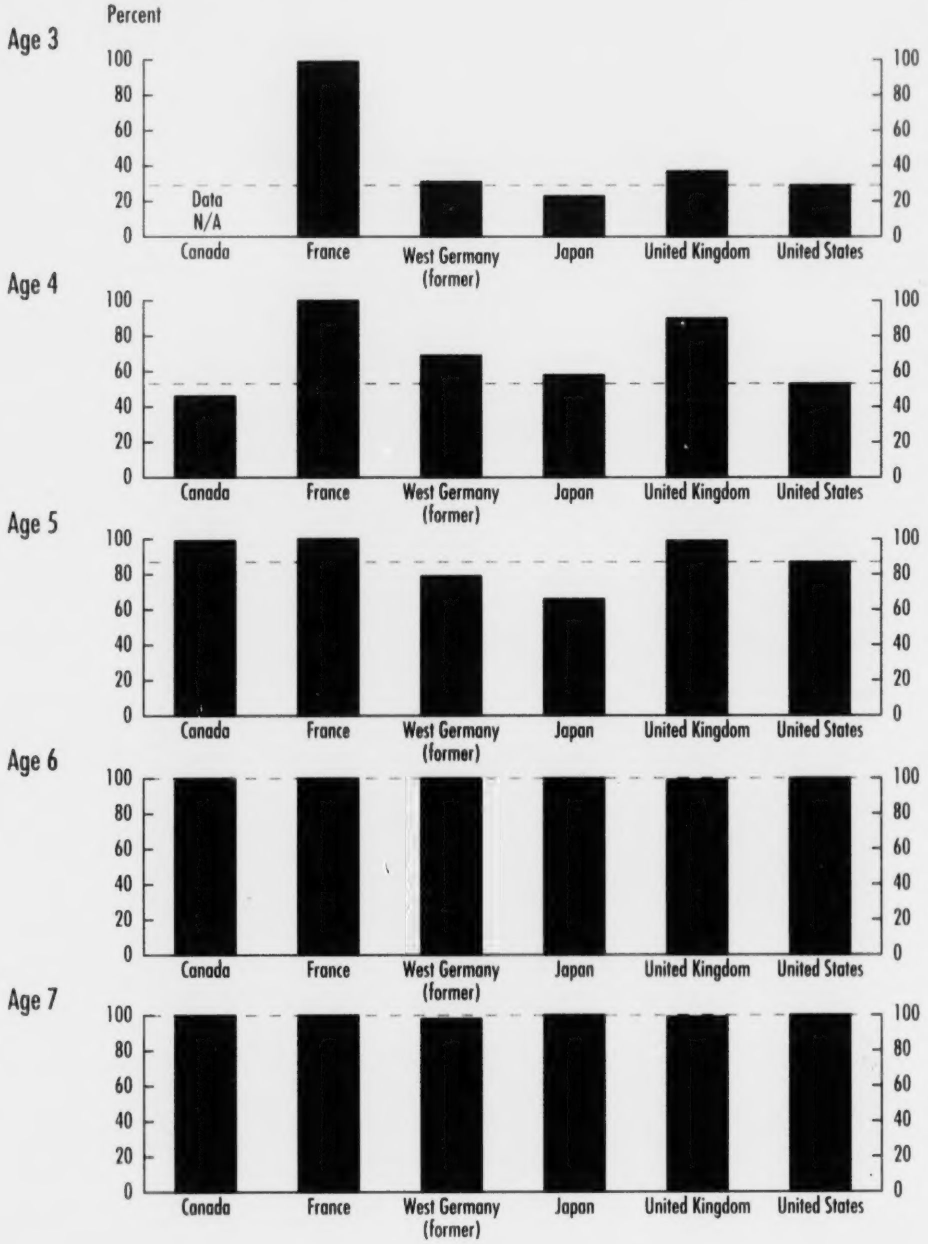
[3] Enrollment for 3-year-olds reflects only enrollment in preprimary education. The other ages reflect both preprimary and primary enrollment.

[4] No data available for Italy.

NOTE: See supplemental note to Indicator 2 for details on indicator calculation for Austria, the Czech Republic, Denmark, the former West Germany, Hungary, Japan, Poland, Spain, and the United Kingdom and for information on the calculation of enrollment rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 2: Enrollment rates in early childhood education, by age and G–7 country:[1,2] 1992



[1] No data available for Italy.

[2] Countries are reported in alphabetical order.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 3: Secondary Education Enrollment

The end point of compulsory education typically occurs during secondary education, and this event influences the percentage of students of a particular age cohort enrolled in secondary education. Secondary education enrollment also reflects the desirability and importance of secondary-level credentials. Secondary education enrollment rates for some countries may be higher than those for others because certain programs offered at higher levels of education in other countries are offered at the secondary level.

- In 1992, enrollment in secondary education was nearly universal for 14- and 15-year-olds in the G–7 countries for which data were available and in the other countries reported, with the exception of Hungary, Poland, and Turkey.
- Secondary enrollment dropped off at different ages in different countries. In the United States, the largest decline occurred between ages 17 and 18, from 72 to 21 percent. The rate declined as early as age 15 in Russia and age 16 in the United Kingdom, whereas several countries had a sizable percentage of 19-year-olds still enrolled in secondary education. For example, more than half of 19-year-olds in the former West Germany were enrolled in secondary education.

Table 3: Enrollment in all public and private secondary education,[1,2] by age and country: 1992

Country	Percent enrolled by single year of age							
	14	15	16	17	18	19	20	21
G–7[3]								
Canada	99.8	98.7	96.3	72.0	36.9	11.1	14.0	0.0
France	94.3	94.1	92.1	87.2	58.6	34.0	12.0	3.1
West Germany (former)	93.9	93.1	95.3	92.8	82.3	55.0	29.3	16.0
Japan	101.6	96.8	95.1	90.3	1.8	—	—	—
United Kingdom	99.6	98.9	75.3	55.3	18.7	4.3	1.9	1.2
United States	**98.7**	**95.7**	**91.4**	**72.0**	**20.6**	**5.8**	**1.7**	**0.6**
Other								
Belgium	98.9	98.7	97.2	93.6	49.8	25.1	10.6	4.4
Czech Republic	106.4	90.2	86.9	39.4	0.0	0.0	0.0	0.0
Denmark	93.4	97.8	92.4	80.1	68.9	48.4	28.3	16.3
Finland	99.8	99.8	94.5	85.8	79.7	26.8	16.5	15.3
Greece	94.2	86.1	88.4	62.1	19.4	10.5	4.7	3.1
Hungary	88.7	84.4	75.2	45.4	12.2	3.9	1.4	0.0
Ireland	97.6	94.3	87.5	70.2	33.1	11.5	7.0	3.6
Netherlands	98.7	99.0	97.3	90.8	67.9	42.3	25.4	14.7
New Zealand	98.9	96.7	87.8	65.7	20.8	5.9	2.4	1.7
Norway	99.4	99.3	92.8	86.6	77.2	34.6	17.6	11.9
Poland	1.4	81.6	85.1	81.6	49.8	17.3	5.8	—
Russia	95.1	59.6	47.7	8.4	0.1	—	—	—
Spain	100.4	91.0	75.6	66.9	35.5	20.7	17.2	10.6
Sweden	99.7	95.6	89.2	87.0	59.6	11.5	2.7	1.7
Switzerland	98.3	95.8	85.2	82.0	74.2	48.9	20.6	8.2
Turkey	47.5	45.9	39.3	33.9	19.8	9.7	6.0	0.0

—Not available.

[1] Full-time equivalent.

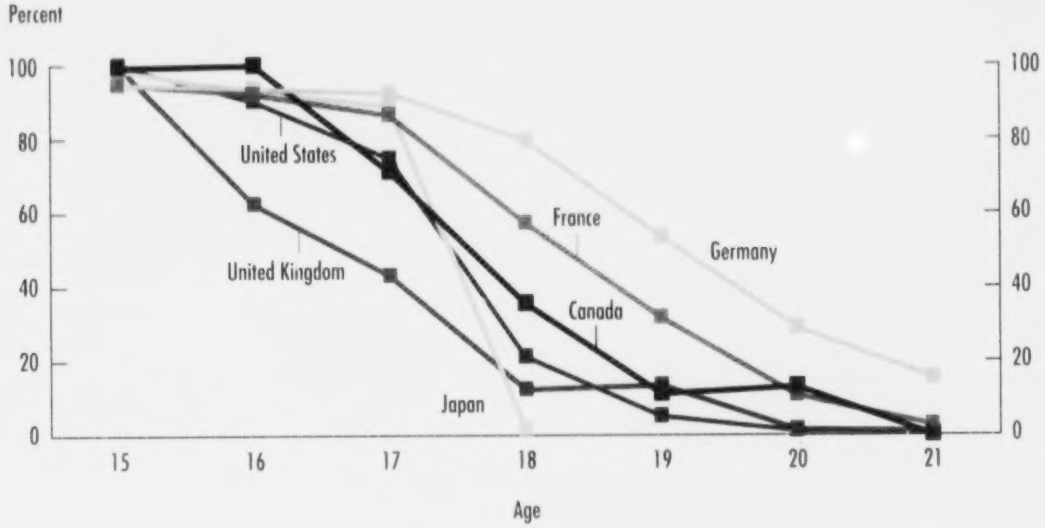
[2] Enrollment rates that exceed 100 reflect measurement error.

[3] No data available for Italy.

NOTE: See supplemental note to Indicator 3 for details on indicator calculation for the Czech Republic, Denmark, Finland, Greece, Hungary, Ireland, Norway, Spain, Sweden, and the United States, for an explanation of the calculation of full-time equivalent enrollments, and for information on the calculation of enrollment rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 3: Percentage enrolled in secondary education, by age and G–7 country:* 1992



*No data available for Italy

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

The structure of upper secondary education

In the United States, a student's involvement in upper secondary education typically ends with graduation from high school at or around age 18. In other countries, however, because upper secondary education is structured differently, it is harder to pinpoint an age or an accomplishment that marks the end of involvement in secondary education. Thus, as the data from Indicator 3 show, upper secondary enrollment rates among people over the age of 19 remain relatively high for some countries (e.g., Germany, Denmark, the Netherlands, and Switzerland), and tend to decrease after age 15–16 for others (e.g., the United Kingdom, Hungary, and the Czech Republic).

Upper secondary school in the United States typically consists of 3 or 4 years of high school. High schools are usually comprehensive, meaning that they do not specialize in one type of program, such as vocational or college preparatory. Students may take some courses in a particular vocational area, although upper secondary school is not generally the time students receive essential training or credentials in vocational areas. On average, 1992 high school graduates earned about 4 credits in vocational courses compared with 17 credits in academic courses.[1] For both college-bound and non-college-bound students, a high school diploma signifies successful completion of upper secondary education. Students then may continue on to postsecondary education or enter the workforce. Beyond the age of 18, few people are enrolled in upper secondary education.

In other countries, upper secondary education can be structured quite differently from the comprehensive, general credential-granting high schools of the United States. In Germany, for instance, the secondary education system is differentiated according to students' postsecondary plans (i.e., university, technical school, or employment), beginning with lower secondary school; and students may earn credentials in a variety of fields. When students enter upper secondary school, they enroll in one of three types. Students who plan to attend a university—approximately 25 percent of youth in a given age cohort[2]—are usually already enrolled in *Gymnasien*, general academic high schools that prepare students to take the rigorous university entrance examination, the *Abitur*. Students not attending Gymnasien may enroll in full-time vocational schools, but the vast majority of students enroll in part-time vocational schools to participate in the *dual system*.

The dual system is Germany's system of apprenticeship.[3] It combines part-time study with part-time work in a specific occupational field. The dual system is the sole means of entry into over 400 occupations, ranging from highly technical fields such as electronics, to white-collar fields such as sales and administration, to traditionally blue-collar occupations such as mechanic, machinist, and craftsman.[4]

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[1] U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1994*, Washington, D.C.: 1994, Indicator 23.

[2] Federal Ministry of Education and Science, *Basic and Structural Data: 1992–93* (Bonn: 1992).

[3] The states of the former Federal Republic of Germany (West Germany) have retained the dual system described here; the newly formed states of the former German Democratic Republic (East Germany) have begun to adopt this system.

Because the certification offered by the dual system is a prerequisite for so many fields, not only do large numbers of students enter it directly after completing lower secondary school (i.e., approximately two-thirds of lower secondary school completers), but significant numbers of students enter it even after having earned secondary certification, either in another type of schooling or in a different occupational field within the dual system. Approximately 90 percent of lower secondary completers participate in the dual system at some point, although not all earn certification.[5] Thus, unlike in the United States, upper secondary education in Germany offers a variety of credentials necessary for employment in certain occupations. In order to earn those credentials, people outside the *typical* age range will enroll or re-enroll in upper secondary school.

As in many states in the United States, school attendance in the United Kingdom is compulsory until the age of 16. However, school attendance in the United States remains fairly high at age 16, whereas in the United Kingdom attendance drops substantially. One explanation for this difference may be found in the certification process. In the United States, the first opportunity for students to receive secondary certification is upon completing high school, usually at age 18. At age 16 in the United Kingdom, students take an examination for the General Certificate of Secondary Education (GCSE). After receiving this certification, students may continue in the same school, usually for 2 more years (1 year in Scotland), ultimately earning the General Certificate of Education (GCE) Advanced (A') level after passing the examination for that level. This is the standard for entrance to higher education and many types of professional training. Other options for those completing the GCSE include entering the workforce or transferring to either a college of further education providing technical training or a technical college, both of which offer a wide range of vocational and academic courses, both full- and part-time.[6]

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[4] Federal Ministry of Education and Science, *Report on Vocational Education* (Bonn: 1991).

[5] Ibid.

[6] Neville T. Postlethwaite, ed., *The Encyclopedia of Comparative Education and National Systems of Education* (New York: Pergamon Press, 1988).

Strategies for preparing youth for employment[1]

Many countries have formalized strategies to prepare non-college-bound youth for employment. Japan, Germany, and Sweden are some of the countries that employ such strategies, including combining schooling with work experience and on-the-job training, providing students with extensive occupational information in school, and offering job placement assistance. While the methods that these countries adopt to meet the needs of non-college-bound youth may differ, the U.S. General Accounting Office reports that the Japanese, German, and Swedish systems share a common underlying feature—each has a national policy focused on preparing non-college-bound youth for employment. While the United States offers its upper secondary students a wide range of educational opportunities (including academic and vocational courses), it does not have a comprehensive strategy or set of programs to facilitate students' transition from school to work. The school-to-work transition strategies utilized by Japan, Germany, and Sweden are described in the following paragraphs.

Japan

Japanese youth who wish to enter the labor force after completing secondary school obtain employment almost exclusively through school-based job referral programs. The system is a cooperative effort between employers, schools, and the Public Employment Security Office (PESO) operated by the Ministry of Labor.

The process begins with companies determining their manpower needs and preparing a recruitment card for each job to be filled. The card describes the job, the company, and the terms and conditions of employment. PESO reviews the card for compliance with applicable standards, such as wages and benefits, and approved cards are used by the schools as the basis for job referral assistance. Many companies also send representatives to visit the schools and to meet with placement counselors—but not with the students, since direct communication between a company offering positions and students seeking employment is prohibited.

The schools take an active role in the job referral system. They maintain placement offices where students can review employer information and recruitment cards. The schools also have full- and part-time placement counselors who assist students with job preferences and advise them on interview and entrance examination strategies. If two or more students from a school are interested in the same position, school staff will confer and decide on the order in which students will apply and take the company's exam. School staff consider grades and behavioral characteristics important to an employer, such as tardiness and absenteeism, when making such decisions. Those students who are not hired by the first company at which they interview may take entrance examinations in a second or third company.

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[1] The primary source of information for this sidebar is the U.S. General Accounting Office report, *Training Strategies: Preparing Noncollege Youth for Employment in the U.S. and Foreign Countries* (Washington, D.C., 1990). Other sources include P. Cappelli, *British Lessons for School-to-Work Transition Policy in the U.S.* (Philadelphia: National Center on the Educational Quality of the Workforce, 1993); The Federal Minister for Education and Science, *Vocational Training in the Dual System in the Federal Republic of Germany* (Bonn: 1992); U.S. Department of Education, *Japanese Education Today* (Washington, D.C., 1987); Central Statistical Office, *Regional Trends 28* (Great Britain: Crown, 1993); and Central Statistical Office, *Social Trends 22* (Great Britain: Crown, 1992).

Students who participate in this system have a better chance of getting a job after graduation than those who do not participate. Nonparticipants and those whom the school does not feel comfortable recommending to a company often end up in temporary or low-wage jobs. After graduation, about 55 percent of students go on to higher education institutions, about 40 percent go into the labor market (the majority have participated in the job referral system), and about 5 percent are unemployed.

Participants in higher education also receive job referral assistance. PESO is not as significant a factor in placing university graduates, since graduates may also apply to companies directly. However, the traditional pattern of direct employer to university faculty or department contact continues to be dominant where prestigious institutions, companies, and fields are concerned. Students also take company examinations and have interviews, but these basically are rituals to confirm decisions reached earlier about a particular student.

Germany

In Germany, schools and employers are linked primarily through an upper secondary education system in which students divide their time between school-based instruction and on-the-job training (apprenticeship) in a chosen occupational area. This approach is often referred to as the dual system. Students who participate in this type of education program generally spend 3 years in the dual system after completing compulsory full-time schooling (i.e., age 15 or 18)—including 1 to 2 days each week studying vocational and academic subjects and the remainder of the week receiving on-the-job training with employers. The main goal of the apprenticeship system is to develop a high-quality skilled workforce; trainees are typically taught more than they may actually use on a specific job. Apprenticeships are available for over 400 skilled occupations.

Approximately two-thirds of all students completing lower secondary education directly pursue training in the dual system and approximately 90 percent do so eventually. A May 1992 report on Germany's dual system released by the Federal Ministry for Education and Science indicates that 6 months after completing training, approximately 60 percent of trainees had received unlimited contracts[2] of employment either in the occupation in which they were trained or in another field; 10 percent were unemployed; 17 percent either went into the military or received a limited contract[3] of employment (either in the trained occupation or another field); and 13 percent were pursuing additional training.

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[2] Unlimited contracts of employment generally last 3 to 4 years and can be renewed or made permanent if both parties so desire.

Sweden

Sweden's approach to preparing youth for the workplace begins early in a child's education. Swedish students aged 7–15 are required to complete between 6 and 10 weeks of work orientation in school. They receive an educational and vocational orientation in school and visit workplaces to gain knowledge of different fields of employment, working environments, and occupations.

Unlike students who participate in Germany's employer-driven apprenticeship system, high school students in Sweden who major in vocational fields receive most of their training in school, spending only 10 percent of the first 2 years of high school at a work site. For those who are enrolled in a 3-year upper secondary vocational education program, work experiences extend to 60 percent of the time in the third year. In addition to emphasizing assistance to students in the transition from school to work, Sweden demonstrates its investment in jobless youth by providing guaranteed training or work for all jobless teenagers.

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[3] Limited contracts can last from 6 weeks to 4 or 5 years. Participants generally go on to permanent jobs.

Indicator 4: Nonuniversity Enrollment

Nonuniversity higher education institutions typically provide occupationally oriented programs that may also allow students to proceed to university degree programs. The percentage of individuals in different age groups (18–21, 22–25, and 26–29) who are enrolled in nonuniversity higher education reflects (1) the role of nonuniversity higher education in the training process, (2) the duration of nonuniversity higher education programs, and (3) the classification of programs as upper secondary, nonuniversity, or university higher education. In countries with relatively high nonuniversity higher education enrollment rates, nonuniversity higher education institutions may provide training and certification for a large number of occupations, whereas in countries with low rates, similar training may occur at other levels in the system.

- Nonuniversity higher education enrollment rates for 18- to 21-year-olds were clustered into two groups in the G–7 countries for which data were available. The United States had relatively high full-time enrollment rates in 1992 (13.8 percent), as did France and Canada, with 8.8 and 8.1 percent, respectively. The former West Germany and the United Kingdom had comparatively low enrollment rates (between 2 and 4 percent). In two other countries, Australia and Belgium, nonuniversity full-time enrollment among 18- to 21-year-olds exceeded 10 percent.
- In most countries, nonuniversity enrollment rates declined to less than 5 percent as students progressed into their late twenties. The highest full-time rate among 26- to 29-year-olds—11 percent—was found in Australia, which is known for its system of continuing education and training. In Canada, France, Belgium, Greece, Hungary, and Turkey, enrollment rates for this age cohort were less than 1 percent.

Table 4: Percentage of young adults enrolled[1] in public and private nonuniversity higher education, by age group and country: 1992

Country	Age 18–21	 22–25	 26–29
G–7[2]			
Canada[3]	8.1	2.7	0.8
France	8.8	2.3	0.3
West Germany (former)	2.3	1.7	1.4
United Kingdom	3.9	2.0	1.1
United States	**13.8**	**6.5**	**4.1**
Other			
Australia	22.9	9.2	11.4
Belgium	14.0	2.5	0.1
Czech Republic	0.8	—	—
Denmark	0.7	2.7	1.4
Finland	4.6	5.9	2.0
Greece	8.2	3.3	0.5
Hungary	4.7	1.4	0.5
New Zealand	4.2	4.2	3.0
Norway	5.7	5.1	2.5
Poland	3.5	1.2	—
Russia	9.5	4.6	—
Spain	0.3	—	—
Sweden	6.3	4.6	2.7
Switzerland	2.4	5.4	3.0
Turkey	1.1	0.3	0.1

—Not available.

[1] Head counts.

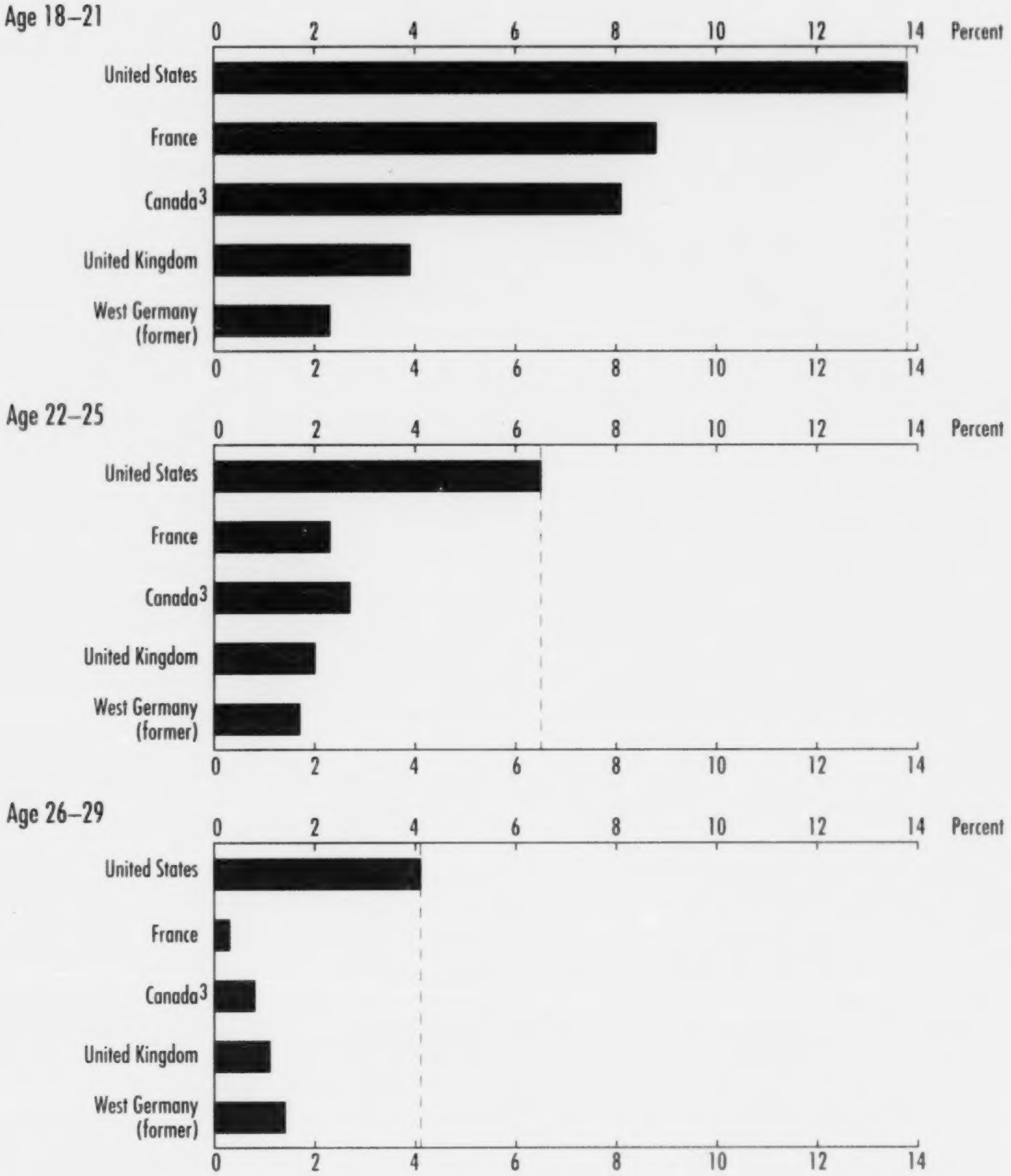
[2] No data available for Italy and Japan.

[3] 1991 data.

NOTE: See supplemental note to Indicator 4 for details on indicator calculation for Australia, Belgium, the Czech Republic, Denmark, France, Poland, and Russia and for information on the calculation of enrollment rates and full-time equivalents.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 4: **Percentage enrolled in nonuniversity higher education, by age group and G–7 country:[1,2] 1992**



[1] No data available for Italy and Japan

[2] Countries are sorted in descending order by the percentage of 18- to 21-year-olds enrolled in nonuniversity higher education.

[3] 1991 data.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 5: University Enrollment

The percentage of students in different age groups (18–21, 22–25, and 26–29) who are enrolled in any type of university or 4-year college (including undergraduate and graduate education) reflects the availability of university education and the extent to which that education provides necessary training for different occupations. A high rate of university enrollment in a country suggests that university education is highly valued and widely available. Enrollment rates may be low in another country, if admission to universities is restricted or if university education is not vital to employment and success in a large number of occupations.

- In the G–7 countries for which data were available, the United States, Canada, and France had the highest enrollment rates for 18- to 21-year-olds in 1992. Furthermore, the rates in the United States and Canada were higher than all other countries with data available.
- Even though the former West Germany had the lowest full-time enrollment rate for 18- to 21-year-olds among this set of G–7 countries, it had the highest rate for 22- to 25-year-olds and 26- to 29-year-olds.

Table 5: Percentage of young adults enrolled[1] in public and private university higher education, by age group and country: 1992

Country	Age		
	18–21	22–25	26–29
G–7[2]			
Canada	23.9	13.9	5.6
France	20.2	11.6	3.8
West Germany (former)	7.4	15.2	9.6
United Kingdom	14.2	4.7	1.8
United States	**25.0**	**12.1**	**5.4**
Other			
Australia	18.8	6.2	5.4
Austria	13.1	15.4	9.0
Belgium	16.9	7.1	1.5
Denmark	7.8	17.2	8.7
Finland	10.3	16.6	8.7
Greece	15.6	1.6	0.3
Hungary	6.0	5.0	1.6
Netherlands	20.1	15.9	4.8
New Zealand	18.8	7.8	3.6
Norway	8.4	15.3	6.5
Poland	8.1	12.1	—
Spain	22.5	14.9	5.4
Sweden	4.3	8.1	3.8
Switzerland	4.8	7.8	4.0
Turkey	7.0	4.9	2.3

—Not available.

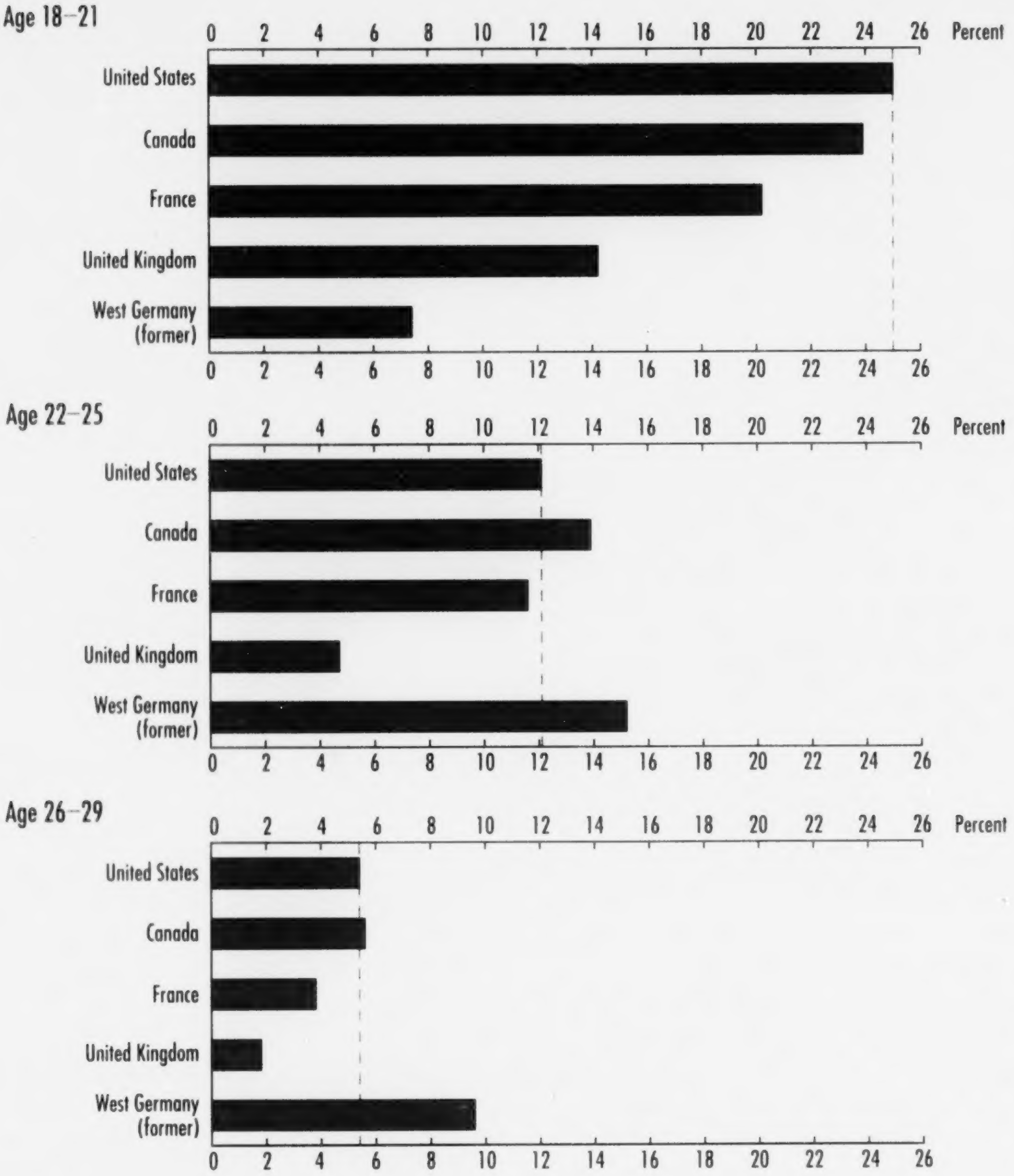
[1] Head counts.

[2] No data available for Italy and Japan.

NOTE: See supplemental note to Indicator 5 for details on indicator calculation for Australia, Belgium, Denmark, France, and Poland and for information on the calculation of enrollment rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 5: Percentage enrolled in university education, by age group and G–7 country:[1,2] 1992

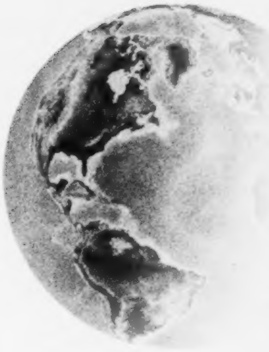


[1] No data available for Italy and Japan.

[2] Countries are sorted in descending order by the percentage of 18- to 21-year-olds enrolled in university education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Differences in programs offered across education levels*



Education programs in the Organization for Economic Co-operation and Development (OECD) member countries are classified as belonging to one of seven levels, which in the United States correspond to the following: preprimary (including kindergarten), elementary school, middle or junior high school, high school, nonbaccalaureate higher education (e.g., 2-year higher education institutions or community colleges), baccalaureate education (e.g., 4-year degree programs at colleges and universities), and graduate school. While the education systems of many other countries are structured similarly to that of the United States in terms of these levels, the training and education offered at them can vary significantly, particularly at the high school level and above. For example, training offered at the nonbaccalaureate higher education level in one country may be offered at the high school level in another, thus contributing to variation in enrollment rates across the levels.

The profession of nursing is just one example of a case where comparable training takes place at different education levels in different countries. In the United States, most nurses (licensed practical nurses and registered nurses) receive their qualifying training in either a nonbaccalaureate or a baccalaureate higher education program. Post–high school vocational training programs, junior college programs, and programs offered at technical institutions are considered nonbaccalaureate higher education programs, while 4-year or longer college programs are considered baccalaureate programs. Comparable training in other countries does, in some cases, take place in nonbaccalaureate higher education programs, but rarely in baccalaureate programs. In France, nurse training occurs in nonbaccalaureate higher education programs offered at public and private schools of nursing. The program is 33 months long and its competitive entrance examination is open to students who have completed their final year of *lycee*, a school roughly comparable to American high school. In Austria and Germany, however, nurse training occurs at the high school level in full-time nurse training schools. Although the nursing program is considered a high school-level program, in Germany students entering the 3-year program must be at least 17 years old and must have already completed 10 years of general education. In Belgium, the 4-year nursing program requires 9 years of compulsory education, and some schools prefer students who have received the maturity certificate, which is typically required of students entering higher education.

Consideration of these situations is especially pertinent when examining enrollments at the high school and nonbaccalaureate higher education levels. Upper-secondary-level apprenticeship and vocational programs in several OECD countries, including Germany, Switzerland, Austria, and Denmark,

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*The primary sources for this sidebar include: U.S. Department of Labor, Bureau of Labor Statistics, *How Workers Get Their Training: A 1991 Update* (Washington, D.C.: 1992) and American Association of Collegiate Registrars and Admissions Officers, Belgium, Federal Republic of Germany, Austria, and France, *World Education Series* (Washington, D.C.: 1985, 1986, 1987, and 1988).

provide the type of specialized occupational training that in the United States does not take place until after high school.

Even at the baccalaureate and graduate school levels, there are significant differences in the types of programs offered. In the United States, people wishing to become doctors or dentists must usually possess a 4-year undergraduate degree before pursuing specialized training in medicine or dentistry. Thus, doctors and dentists possess two university degrees. In contrast, the certificate to practice medicine or dentistry is often the first university degree in many countries and may come after anywhere between 5 years of study (as in the case of dentistry in Belgium, Germany, and France) and 8 years of study (as in the case of medicine in France).

Enrollment rates are also influenced by the availability and accessibility of education at different levels. To illustrate, higher education enrollment rates in the United States are elevated compared with other countries in part because higher education is much more accessible in the United States than in other countries, both in terms of the number of openings and the range of admission standards for entering students.

Indicator 6: Enrollment in Upper Secondary or Higher Education

The percentage of 17- to 24-year-olds enrolled in upper secondary or higher education not only indicates the extent to which these cohorts of young adults participate in noncompulsory formal education, but also reveals how educational participation varies among these age groups. Cross-country variations in educational participation for these cohorts reflect, among other things, differences in the structure of upper secondary and higher education and in programs offered at these levels. For instance, previous indicators of student enrollment revealed that the former West Germany had a higher enrollment rate in upper secondary education but a lower enrollment rate in higher education than did the United States. However, when upper secondary and higher education are combined, the relatively high enrollments in U.S. higher education are overshadowed by the relatively high upper secondary enrollments in the former West Germany. Consequently, Indicator 6 shows a consistently higher level of educational enrollment in the former West Germany than in the United States across all the cohorts aged 17–24.

- In the United States, about 74 percent of 17-year-olds were enrolled in high school or higher education in 1992. The enrollment rate gradually declined with age; the corresponding enrollment rate for 24-year-olds was about 8 percent. With few exceptions, this pattern of decline with age in enrollment rates existed for almost every country reported.
- The enrollment rates for upper secondary or higher education in the former West Germany, Canada, and France were consistently higher than the corresponding enrollment rates for the United States across all the age cohorts. In the United Kingdom, the corresponding enrollment rates were significantly lower than those of their counterparts in the United States.

Table 6: Percentage enrolled[1] in upper secondary or higher education,[2] by age and country: 1992

	Age							
Country	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
G–7[3]								
Canada	80.2	60.8	47.0	47.6	28.4	21.4	14.3	9.6
France	84.9	77.9	64.6	46.6	33.5	23.8	15.8	10.1
West Germany (former)	81.7	82.8	61.1	41.2	31.1	36.8	18.7	18.4
United Kingdom	56.7	33.6	23.9	19.5	13.7	8.1	5.2	3.7
United States	**74.0**	**54.0**	**42.4**	**32.9**	**28.3**	**19.6**	**12.6**	**8.4**
Other								
Australia	72.0	42.5	29.9	23.0	13.6	9.0	6.3	4.6
Belgium	90.6	75.2	59.6	43.9	31.1	20.0	11.5	6.6
Czech Republic	39.4	17.0	14.4	12.4	12.4	9.6	1.4	1.4
Denmark	73.8	68.5	53.1	41.2	34.7	31.2	26.3	24.2
Finland	85.2	81.7	39.5	36.3	40.3	40.1	33.2	27.0
Hungary	45.4	18.2	14.2	12.9	10.0	7.8	5.4	3.2
Ireland	76.5	57.5	39.1	29.6	19.4	11.1	6.1	4.0
Netherlands	74.7	73.4	61.5	48.5	38.7	28.0	21.6	16.2
New Zealand	65.2	38.8	29.6	24.8	19.3	12.1	7.5	5.2
Norway	86.7	77.7	48.6	36.9	33.4	30.3	26.0	21.1
Spain	67.3	53.8	44.8	42.7	34.0	27.9	19.3	14.0
Sweden	86.9	60.8	24.3	16.5	16.1	27.9	13.7	12.5
Switzerland	77.8	74.7	52.6	29.5	20.5	17.0	14.6	12.4
Turkey	32.2	26.1	18.2	15.1	8.8	7.2	5.6	4.1

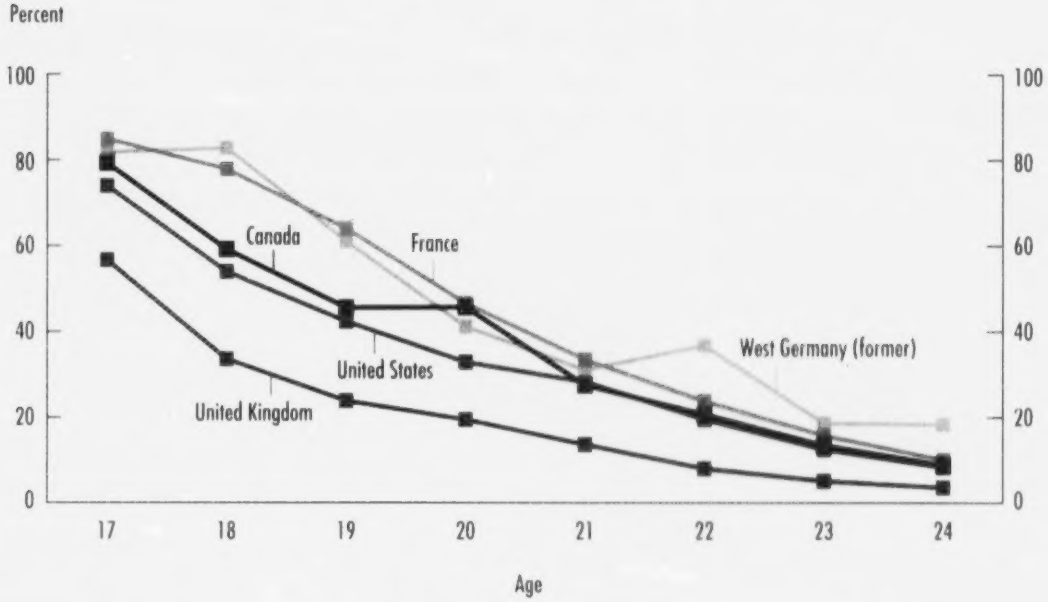
[1] Full-time students only. The indicator does not reflect overall rates of education participation for those countries that distinguish part-time from full-time enrollments.

[2] Includes nonuniversity and university higher education.

[3] No data available for Italy and Japan.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 6: Percentage enrolled in upper secondary or higher education, by age and G–7 country:* 1992



*No data available for Italy and Japan.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

ACHIEVEMENT AND ATTAINMENT

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ACHIEVEMENT AND ATTAINMENT

The United States is currently devoting considerable attention to establishing high standards for student achievement. The performance of students in other countries can provide valuable information toward establishing these standards. During the past several years, international assessments have been conducted in reading, science, geography, and mathematics.

U.S. students perform well in comparison with their peers in other countries in reading (Indicator 7). They perform less well in science and geography (Indicators 8 and 9). Their weakest area relative to students in other countries is mathematics on a mathematics assessment. Both 9- and 13-year-olds scored lower than their counterparts in the vast majority of participating countries (Indicator 8). Only about 10 percent of U.S. 13-year-olds scored as well as the top 50 percent in Taiwan, the highest performing country (Indicator 8).

When interpreting the results of international assessments, it is important to remember that there is always variation in student performance within countries. Compared with other participating countries, this variation in the United States is generally relatively large. For example, whereas 9-year-olds in the United States performed relatively well on average on the science assessment, scores of the students in the bottom 10 percent were lower than those of the bottom 10 percent in many countries (Indicator 8).

Also, test performance is the ultimate result of many factors, and test score differences should not be interpreted as direct indicators of differences in school quality. They may also reflect differences in time spent on subjects, the match between curriculum and test items, and differences in curricular styles. For example, the Second International Mathematics Study of 1982 (SIMS) found that the U.S. eighth grade mathematics curriculum was devoted largely to arithmetic, while in Japan the focus was on algebra. Also, while mathematics content areas tend to be divided among several grades in the United States, instruction in major content areas is concentrated in a single grade in France and Japan (see the sidebar entitled *Curricular requirements: mathematics*).

Countries' educational accomplishments can also be compared by looking at the educational attainment of adults. On these measures, the United States consistently compares favorably with other countries. For example, the United States had one of the highest concentrations of adults scoring at the highest levels of literacy (Indicator 10). Adults ages 25–64 in the United States have completed higher levels of schooling than adults in most other countries. The United States and Canada stand out particularly for the high percentage of their populations in this group who have completed higher education (Indicator 11). However, as in all the other countries reported, females ages 25–64 are underrepresented among higher education graduates in these two countries (Indicator 13). This is not true, however, for females ages 25–34. The percentage of males and females in this age cohort who have completed higher education is very similar (see supplemental table 3). Examination of the upper secondary level completion rates of different age cohorts suggests that attainment of this level is increasing in all countries (Indicator 12). Science and engineering degrees comprised a smaller percentage of all university degrees awarded in the United States than in most other countries in 1992 (Indicator 14).

Using data from sample surveys

Two important sources of data for this report provide estimates based on sample surveys. Figures from the *International Assessment of Educational Progress* (IAEP) are derived from samples of students and school administrators. Figures from the *International Association for the Evaluation of Educational Achievement's* (IEA) Reading Literacy Study are derived from samples of students and teachers. Because data on the entire population are not collected in sample surveys, the resulting estimates may differ somewhat from estimates that would have been obtained from the whole population using the same instruments, instructions, and procedures.

The samples used in surveys are selected from a large number of possible samples of the same size that could have been selected using the same sample design. Estimates derived from the different samples would differ from each other. The difference between a sample estimate and the average of all possible samples is called the sampling deviation. The standard or sampling error of a survey estimate is a measure of the variation among the estimates from all possible samples and, thus, is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples.

The estimated standard errors for two sample statistics can be used to estimate the precision of the difference between the two statistics and to avoid concluding there is an actual difference when the difference in sample estimates may only be due to sampling error. The need to be aware of the precision of differences arises, for example, when comparing mean proficiency scores between countries in the IAEP. The standard error, S_{A-B}, of the difference between sample estimate A and sample estimate B (when A and B do not overlap) is

$$s_{A-B} = \sqrt{s_A^2 + s_B^2}$$

where s_A and s_B are the standard error of sample estimates A and B, respectively. When the ratio (called a *t*-statistic) of the difference between the two sample statistics and the standard error of the difference as calculated above is less than 2, one cannot be sure the difference is not due only to sampling error and caution should be taken in concluding there is a difference. In this report, for example, if the *t*-statistics were less than 1.96, we would not conclude there is a difference. Some analysts, however, use the less restrictive criterion of 1.64, which corresponds to a 10 percent significance level.

To illustrate this further, consider the data on reading proficiency of 14-year-olds in table 7a and the associated standard error table 7b. The estimated average overall reading proficiency score for the sample of 14-year-olds in the United States was 535. For the sample in France, the estimated average was 549. Is there enough evidence to safely conclude that this difference is not due only to sampling error and that the actual average reading proficiency of 14-year-olds in the United States is lower than for their counterparts in France? The standard errors for these two estimates are 4.8 and 4.3, respectively. Using the above formula, the standard error of the difference is calculated as 6.4. The ratio of the estimated difference of 14 to the standard error of the difference of 6.4 is 2.19. Using the table below, it can be seen that there is less than 5 percent chance that the 14 point difference is due only to sampling error and one may safely conclude that the average proficiency score of 14-year-olds in the United States is lower than of their counterparts in France.

Percent chance that a difference is due only to sampling error:

t-statistic	1.00	1.64	1.96	2.00	2.57
Percent chance*	32	10	5	4.5	1

The above procedure applies if one is only comparing students in France and the United States. However, most readers draw conclusions after making multiple comparisons within a table. In these circumstances, the chance that one of the many differences examined is only a result of sampling error increases (accumulates) as the number of comparisons increases. The Bonferroni procedure can be used to ensure that the likelihood of any of the comparisons being only a result of sampling error stays less than 5 percent is to reduce this risk for each of the comparisons being made. If N comparisons are being made then divide 5 percent by N and ensure that the risk of a difference being due only to sampling error is less than 5/N for each comparison. The table below provides critical values for the *t*-statistic for each comparison when it is a part of N comparisons.

Number of comparisons	1	2	3	4	5	10	20	40
Critical value*	1.96	2.24	2.39	2.50	2.58	2.81	3.02	3.23

For example, a reader might examine table 7a not for the purpose of comparing the United States to France but to compare the United States to, say, other G–7 countries, which includes three of the countries in the table. After making three comparisons, the reader may want to draw the conclusion: "Fourteen-year-olds in only one of the three countries, France, had higher average reading proficiency scores than 14-year-olds in the United States." However, because the reader is now making three comparisons and not just one, the critical value of *t* is 2.39 and not 1.96. Thus, since 2.19 (the *t*-statistic for the United States-France comparison) is not larger than 2.39, the conclusion is not safe to make.

It should be noted that most of the standard error estimates presented in subsequent sections and in the original documents are approximations. That is, to derive estimates of standard errors that would be applicable to a wide variety of items and could be prepared at a moderate cost, a number of approximations was required. As a result, the standard error estimates provide a general order of magnitude rather than the exact standard error for any specific item.

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*Based on a 2-tailed test.

In addition to such sampling errors, all surveys, both universe and sample, are subject to design, reporting, and processing errors and errors due to nonresponse. To the extent possible, these nonsampling errors are kept to a minimum by methods built into the survey procedures. In general, however, the effects of nonsampling errors are more difficult to gauge than those produced by sampling variability.

Indicator 7: Reading Literacy

Reading literacy is a fundamental academic skill that students must possess before they can benefit from the rest of their education, participate effectively in labor markets that require increasingly sophisticated training, and meet their civic responsibilities. Measures of the reading proficiency of 9- and 14-year-old students provide an indication of the extent to which students can read, comprehend, and use written language. Since the overall scores reflect average performance within a country, they do not provide information about differences in literacy among subpopulations. For example, in the United States, differences in race and ethnicity, home language, urbanicity, sex, and the availability of books are all associated with differences in reading literacy scores.

- During the 1991–92 school year, 9-year-old students in the United States on average performed at or above the level of their peers in all the participating countries, except Finland, on overall and domain-specific* measures of reading literacy. (Students in Finland achieved the highest scores in almost every reading domain at age 9.)
- At age 14, students in the United States achieved higher levels of reading literacy (overall and domain-specific) than their peers in many of the other participating countries. None of the participating G–7 countries outperformed U.S. students in this age group.
- There is greater variation in the reading literacy of students within each country than exists across the highly industrialized countries. To illustrate, in the narrative domain there was a difference of 235 scale points between the 10th and 90th percentiles for 9-year-olds in the United States, compared with a difference of 62 scale points between the United States and the former West Germany.

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*The three major domains or types of reading literacy materials assessed at both age levels (9- and 14-year-old students) were: narrative prose, expository prose, and documents. See *Sources of Data* for details on these domains of reading literacy.

Table 7a: Average reading literacy scale scores, by domain, age, and country: 1991–92

			Average domain scale score					
	Average overall score		Narrative		Expository		Documents	
Country	**Age 9**	**Age 14**	**Age 9**	**Age 14**	**Age 9**	**Age 14**	**Age 9**	**Age 14**
G–7[*]								
France	531	549	532	556	533	546	527	544
West Germany (former)	503	522	491	514	497	521	520	532
Italy	529	515	533	520	538	524	517	501
United States	**547**	**535**	**553**	**539**	**538**	**539**	**550**	**528**
Other								
Belgium	507	481	510	484	505	477	506	483
Botswana	—	330	—	340	—	339	—	312
British Columbia, Canada	500	522	502	526	499	516	500	522
Cyprus	481	497	492	516	475	492	476	482
Denmark	475	525	463	517	467	524	496	532
Finland	569	560	568	559	569	541	569	580
East Germany (former)	499	526	482	512	493	523	522	543
Greece	504	509	514	526	511	508	488	493
Hong Kong	517	535	494	509	503	540	554	557
Hungary	499	536	496	530	493	536	509	542
Iceland	518	536	518	550	517	548	519	509
Ireland	509	511	518	510	514	505	495	518
Netherlands	485	514	494	506	480	503	481	533
New Zealand	528	545	534	547	531	535	521	552
Norway	524	516	525	515	528	520	519	512
Portugal	478	523	483	523	480	523	471	523
Singapore	515	534	521	530	519	539	504	533
Slovenia	498	532	502	534	489	525	503	537
Spain	504	490	497	500	505	495	509	475
Sweden	539	546	536	556	542	533	539	550
Switzerland	511	536	506	534	507	525	522	549
Thailand	—	477	—	468	—	486	—	478
Trinidad/Tobago	451	479	455	482	458	485	440	472
Venezuela	383	417	378	407	396	433	374	412
Zimbabwe	—	372	—	367	—	374	—	373

—Country did not participate at this age level.

[*] No data available for Canada, Japan, and the United Kingdom.

NOTE: Proficiency scores range from 0 to 1000. The mean proficiency score for all participating populations (9- to 14-year-olds taken together) is 500 and the standard deviation is 100. Characteristics of country populations are described in the supplemental note to Indicator 7.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1994*, Washington, D.C.: 1994, tables 16-1, 16-2, and 16-3.

Table 7b: Standard errors for estimated averages in Table 7a

			Average domain scale score					
	Average overall score		Narrative		Expository		Documents	
Country	**Age 9**	**Age 14**	**Age 9**	**Age 14**	**Age 9**	**Age 14**	**Age 9**	**Age 14**
G–7[1]								
France	4.0	4.3	4.1	4.2	4.1	4.3	3.9	4.2
West Germany (former)	3.0	4.4	2.8	4.9	2.9	4.5	3.2	3.9
Italy	4.3	3.4	4.0	3.6	4.0	3.2	4.9	3.3
United States	**2.8**	**4.8**	**3.1**	**4.9**	**2.6**	**5.6**	**2.7**	**4.0**
Other								
Belgium	3.2	4.9	3.3	5.1	2.8	4.8	3.5	4.7
Botswana	—	2.0	—	1.6	—	1.9	—	2.4
British Columbia, Canada	3.0	3.0	3.5	3.1	2.7	3.1	2.8	2.7
Cyprus	2.3	2.2	2.4	2.2	2.3	2.4	2.1	2.0
Denmark	3.5	2.1	3.4	2.0	3.5	2.2	3.6	2.1
Finland	3.4	2.5	3.0	2.8	3.1	2.2	4.0	2.5
East Germany (former)	4.3	3.5	4.2	3.9	3.6	3.5	5.0	2.9
Greece	3.7	2.9	3.8	2.9	3.6	3.1	3.8	2.6
Hong Kong	3.9	3.7	4.1	3.7	3.4	3.8	4.2	3.8
Hungary	3.1	3.3	2.9	3.1	3.1	3.6	3.5	3.2
Iceland[2]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	3.6	5.2	3.7	5.3	3.2	5.3	3.8	4.9
Netherlands	3.6	4.9	3.3	4.8	3.4	4.7	3.9	5.3
New Zealand	3.3	5.6	3.5	5.7	3.1	5.7	3.3	5.3
Norway	2.6	2.3	2.8	2.1	2.3	2.4	2.8	2.4
Portugal	3.6	3.1	3.3	2.5	3.0	3.4	4.5	3.4
Singapore	1.0	1.1	1.1	1.1	1.0	1.2	1.0	1.1
Slovenia	2.6	2.3	2.7	2.6	2.5	2.2	2.5	2.2
Spain	2.5	2.5	2.4	3.0	2.3	2.6	2.7	2.0
Sweden	2.8	2.5	2.6	2.6	2.7	2.4	3.2	2.4
Switzerland	2.7	3.2	2.6	3.4	2.7	3.2	2.8	3.0
Thailand	—	6.2	—	6.6	—	5.9	—	6.2
Trinidad/Tobago	3.4	1.7	3.6	1.7	3.4	1.8	3.3	1.7
Venezuela	3.4	3.1	3.2	2.9	3.3	3.3	3.7	3.0
Zimbabwe	—	3.8	—	3.3	—	3.6	—	4.6

—Not available.

[1] No data available for Canada, Japan, and the United Kingdom.

[2] All students were tested in Iceland.

NOTE: See supplemental note to Indicator 7 for details on population exclusions.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1994*, Washington, D.C.: 1994, tables 16-1, 16-2, and 16-3.

Table 7c: Percentile scores for the narrative domain, by age and country: 1991

	Percentile scores							
	Age 9				Age 14			
Country	1st	10th	90th	99th	1st	10th	90th	99th
G–7*								
France	335	411	640	701	362	447	639	748
West Germany (former)	226	372	594	690	323	411	622	736
Italy	303	411	627	701	324	413	616	727
United States	**330**	**420**	**655**	**708**	**324**	**410**	**673**	**764**
Other								
Belgium	293	385	612	695	242	360	572	685
Botswana	—	—	—	—	121	247	411	452
British Columbia, Canada	186	389	619	697	290	394	635	750
Cyprus	283	373	601	686	282	378	601	705
Denmark	186	299	592	682	295	411	636	741
Finland	353	466	649	708	354	453	628	699
East Germany (former)	219	361	590	686	315	408	633	708
Greece	303	400	622	699	322	401	602	711
Hong Kong	273	383	601	677	343	434	621	718
Hungary	299	390	588	661	326	420	640	748
Iceland	297	390	627	700	316	413	660	748
Ireland	301	390	631	701	282	384	630	725
Netherlands	311	382	591	688	291	395	593	694
New Zealand	299	403	647	707	290	410	660	757
Norway	186	390	629	702	313	413	609	713
Portugal	300	386	587	670	341	429	606	698
Singapore	306	395	623	701	367	434	629	735
Slovenia	296	389	648	700	360	441	607	700
Spain	291	389	597	687	308	391	581	688
Sweden	239	406	644	706	324	420	637	749
Switzerland	237	391	602	696	307	412	632	722
Thailand	—	—	—	—	239	363	573	662
Trinidad/Tobago	232	343	567	696	255	358	600	729
Venezuela	186	220	474	554	220	330	526	629
Zimbabwe	—	—	—	—	139	291	453	551

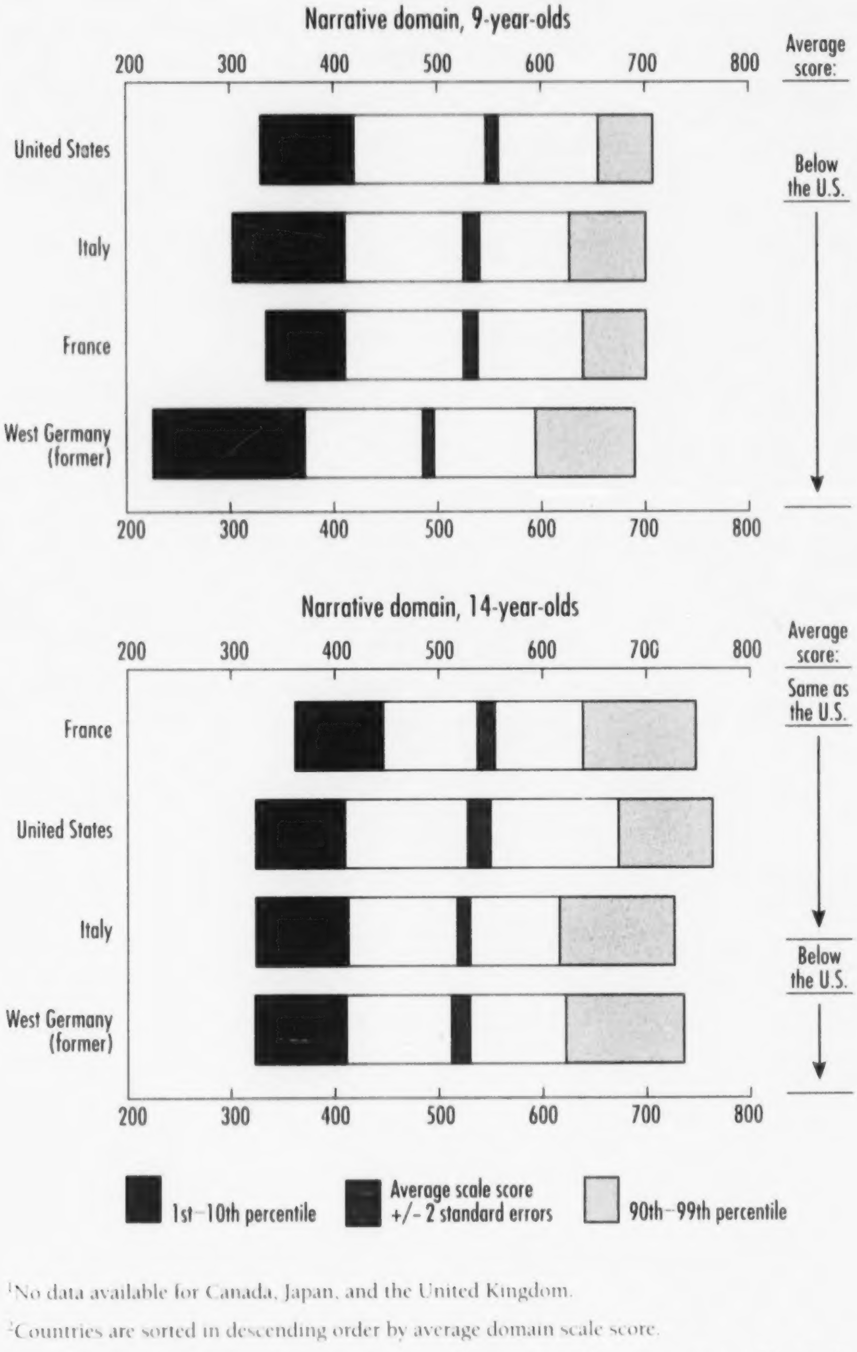
—Not available.

*No data available for Canada, Japan, and the United Kingdom.

NOTE: Characteristics of country populations are described in the supplemental note to Indicator 7.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1994*, Washington, D.C.: 1994, tables 16-1, 16-2, and 16-3.

Figure 7: Average reading literacy scale scores, by domain, age, and G–7 country:[1,2] 1991–92



[1] No data available for Canada, Japan, and the United Kingdom.

[2] Countries are sorted in descending order by average domain scale score.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1994*, Washington, D.C.: 1994, Indicator 16.

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Comparing reading scores from the International Association for the Evaluation of Educational Achievement's (IEA) Reading Literacy Study and the National Assessment of Educational Progress (NAEP)

In contrast to the positive results provided by the IEA Reading Literacy Study, where American 4th- and 9th-grade students do well when compared with students from other countries, the picture of American students' reading proficiency provided by the National Assessment of Educational Progress (NAEP) is less optimistic. For example, in 1992 NAEP reported that less than 30 percent of 4th- and 8th-graders and only 40 percent of 12th-graders met or exceeded the Proficient level in reading.[1] Proficient is the central level and represents solid academic performance and competency over challenging subject matter relevant for each grade level. The Advanced achievement level is the highest level, signifying superior performance beyond Proficient. Very few students at any of the three grades assessed attained the Advanced level (only 3 to 6 percent). By 1994, the NAEP picture was slightly worse, as the average reading proficiency of 12th-grade students declined significantly from 1992–94.[2] It should be noted that the setting of achievement levels for the national assessment is relatively new and in transition.

This contrast between the positive results reported by IEA and the less positive results reported by NAEP could imply that IEA and NAEP report or measure different things. This question is addressed in the following discussion.

Differing points of comparison

One of the first things to consider is that although both studies provide descriptions of reading performance of analogous samples of students, the basis for reporting differs considerably.

In the case of IEA, reporting is based on comparisons of the performance of groups of students within and across countries. Student performance in one country is compared with that of students in the other participating countries. Or, students in one subgroup within a country are compared with other students in other subgroups within the same country. These comparisons address issues such as mean performance of each country or the distribution of scores within a country as compared with the distribution of scores in other countries. As such, the point of comparison is a relative or normative comparison rather than an absolute comparison. In other words, students are always being compared against other students and not against a standard set of criteria on knowledge.

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[1] I.V. Mullis, J.R. Campbell, and A.E. Farstrup, *NAEP 1992 Reading Report Card for the Nation and the States* (Washington, D.C.: 1993).

[2] J.R. Campbell, P.L. Donahue, C.M. Reese, and G.W. Phillips, *NAEP 1994 Reading Report Card for the Nation and the States* (Washington, D.C.: 1996).

Much of the NAEP reporting, on the other hand, is based on comparisons between actual student performance and desired performance. It is a comparison against an absolute standard or criterion that is defined independently of what students do. As such, the reporting is referenced to a description of the tasks that students are expected to be able to do, or that someone or some group thinks they should be able to do. This is a criterion-referenced comparison.

Success or failure in either context does not necessarily imply success or failure in the other context. Consequently, American students do very well based on the relative comparisons used by IEA, but within the NAEP context, they do not do as well as the National Assessment Governing Board (NAGB) believes they should be doing.

Differing emphases

In addition, NAEP and IEA assess different aspects of reading. More than 90 percent of the IEA items assess tasks covered in only 17 percent of NAEP items. Further, virtually all the IEA items are aimed solely at literal comprehension and interpretation. Items of that kind make up only one-third of NAEP reading assessments.

Both IEA and NAEP expect literal comprehension and the development of understanding. Both define domains of reading literacy. However, there is a major difference between IEA and NAEP in what students must do to demonstrate their comprehension. While success in IEA depends on reaching and correctly answering more questions directly related to a reading passage, to reach NAEP's advanced level, more interpretive and higher level thinking is required. Fourth-grade students in NAEP, for example, had to interpret text, summarize information across text, develop ideas about textual information, and formulate more complex questions about text.[3] Eighth-graders were required to show an even greater level of competency. They had to compare and contrast information across multiple texts, connect inferences with themes, understand underlying meanings, integrate prior knowledge with text interpretations, and demonstrate some ability to evaluate the limitations of documents.[4]

Equally important is the fact that NAEP requires students to generate answers in their own words much more frequently than IEA, which mainly asks students to respond to the test designers' options. Thus the skills required by IEA reading tasks can be seen as a subset of those required by NAEP. Moreover, the IEA test items did not cover the entire expected ability range. Many American students got every item correct, creating a ceiling effect. Thus, distinguishing between abilities of students in the upper range is not possible.

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[3] Mullis, Campbell, and Farstrup, op. cit.

[4] Ibid.

In contrast, the range of item difficulty on the NAEP reading assessment exceeds the ability of most American students. Few, if any, students would correctly answer all items. Thus, differences in the abilities of students in the upper range can be distinguished easily.

One might wonder whether students in the other participating countries would do better than American students on the standards set by NAGB. There is a high probability that the rank ordering or relative performance of countries would remain pretty much the same.[5] Therefore, it seems reasonable to conclude that American students would do well as compared with students in other countries even if the NAEP test were administered.

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[5] This statement is derived from the theoretic underpinnings of item response theory and its application to the test scaling used for both the IEA Reading Literacy Study and the NAEP Reading Assessment.

Indicator 8: Achievement in Mathematics and Science

To meet the challenges of the technological age, U.S. policymakers have focused increasing attention on developing a mathematically and scientifically literate populace beginning with early education. Comparing the scores of 9- and 13-year-old students in different countries on an assessment of mathematics and science proficiency enables the United States to gauge its performance in these crucial areas against that of its economic competitors and predict the competency of students emerging from our schools. Factors that may contribute to differences in scores across countries include time spent studying the subjects, both in and out of school; correspondence of the test questions with the curriculum to which students are exposed; and quality and method of instruction.

- U.S. students compared more favorably with their counterparts in other countries on the assessment of science achievement than they did on the mathematics assessment. Among 9-year-olds, students from no other country but Korea scored significantly higher, on average, than U.S. students on the science assessment.[1] [2] Among 13-year-olds, the average science proficiency score of U.S. students was comparable to those of students in Canada, France, Ireland, Israel, Scotland, and Spain, and higher than the scores for Jordan.
- In the 1991 mathematics assessment, only 9-year-olds in Slovenia and 13-year-olds in Jordan and Spain scored approximately the same or lower than their U.S. counterparts. Nine- and 13-year-olds in the United States scored below students in the same age groups in the other participating countries. Korean students scored highest among the 9-year-olds, and Taiwanese, Korean, and Swiss students scored highest among the 13-year-olds.
- The difference in scores between the highest scoring students (the 99th percentile) and the lowest scoring students (the 1st percentile) was either similar or, in most cases, greater in the United States than in other countries on both assessments. According to this measure, however, Taiwan and Korea, high-scoring countries on both assessments for both age groups, had similar disparities.

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[1] Tests of significance were performed with the Bonferroni procedure using 9 comparisons at the age 9 level and 13 comparisons at the age 13 level based on the number of countries with data available at the different age levels.

[2] Students in Taiwan also scored higher than U.S. students, but the difference was not great enough to be considered statistically significant.

Table 8a: Average proficiency scores[1] in mathematics and science, by age and country: 1991

Country	Mathematics Age 9	Mathematics Age 13	Science Age 9	Science Age 13
G–7[2]				
Canada	430 (1.5)	513 (1.4)	437 (1.9)	533 (1.6)
France	—	519 (1.8)	—	532 (2.5)
United States	**420 (3.2)**	**494 (2.9)**	**446 (4.6)**	**521 (4.4)**
Other				
Hungary	452 (1.9)	529 (2.0)	438 (2.4)	553 (2.5)
Ireland	426 (2.3)	509 (2.0)	401 (3.4)	510 (2.5)
Israel	442 (2.1)	517 (1.8)	431 (3.1)	534 (2.8)
Jordan	—	458 (2.6)	—	473 (3.3)
Korea	473 (1.8)	542 (1.9)	460 (2.3)	571 (2.3)
Scotland	—	511 (2.0)	—	530 (2.8)
Slovenia	413 (1.4)	504 (1.7)	403 (2.2)	537 (2.2)
Soviet Union (former)	447 (3.3)	533 (2.2)	434 (5.1)	541 (3.5)
Spain	432 (2.9)	495 (1.8)	430 (3.6)	525 (2.3)
Switzerland	—	539 (2.7)	—	562 (3.6)
Taiwan	454 (2.2)	545 (2.0)	456 (2.7)	563 (1.9)

—Did not participate in assessment or were excluded (see NOTE).

[1] Standard errors are in parentheses.

[2] No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: Proficiency scores range from 0 to 1000. The mean proficiency score for all participating populations (9- and 13-year-olds together) is 500 and the standard deviation is 100.

Only countries in which the test-taking samples represented comprehensive student populations were included. Brazil, China, England, Portugal, and Scotland (9-year-olds only) were not reported since they either excluded groups or had participation rates below .70.

See supplemental note to Indicator 8 for details on population exclusions.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, 1992.

Table 8b: Percentile scores in mathematics, by age and country: 1991

	Percentile scores									
	Age 9					Age 13				
	1st	10th	Median	90th	99th	1st	10th	Median	90th	99th
G–7*										
Canada	296	363	435	490	537	400	462	515	564	608
France	—	—	—	—	—	404	460	521	574	616
United States	**278**	**333**	**427**	**492**	**549**	**366**	**430**	**495**	**554**	**616**
Other										
Hungary	312	379	455	520	573	401	465	531	588	639
Ireland	273	345	433	493	545	381	449	514	565	614
Israel	310	373	445	504	555	396	462	520	567	607
Jordan	—	—	—	—	—	345	390	459	520	568
Korea	334	407	475	534	586	390	470	545	609	665
Scotland	—	—	—	—	—	400	454	513	564	604
Slovenia	303	355	417	467	508	407	445	507	556	599
Soviet Union (former)	310	374	450	514	579	413	477	536	584	629
Spain	287	353	437	499	551	390	446	496	542	577
Switzerland	—	—	—	—	—	443	491	542	586	631
Taiwan	304	384	457	521	571	368	454	550	631	694

—Did not participate in assessment or were excluded (see NOTE for Table 8a).

*No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: Proficiency scores range from 0 to 1000. The mean proficiency score for all participating populations (9- and 13-year-olds together) is 500 and the standard deviation is 100.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1995*, Washington, D.C., 1995, Indicator 18.

Table 8c: Percentile scores in science, by age and country: 1991

	Percentile scores									
	Age 9					Age 13				
	1st	10th	Median	90th	99th	1st	10th	Median	90th	99th
G–7*										
Canada	257	346	443	517	582	384	460	534	606	670
France	—	—	—	—	—	370	442	534	611	677
United States	**235**	**328**	**453**	**543**	**605**	**334**	**436**	**523**	**601**	**665**
Other										
Hungary	270	360	441	511	567	386	467	555	639	717
Ireland	221	289	408	496	561	334	418	511	594	668
Israel	247	337	430	524	595	379	449	536	614	676
Jordan	—	—	—	—	—	292	375	480	557	628
Korea	303	383	460	541	609	395	490	575	648	710
Scotland	—	—	436	—	—	363	441	532	611	674
Slovenia	262	325	405	478	528	398	461	539	615	671
Soviet Union (former)	284	356	433	515	588	383	465	545	612	661
Spain	250	334	435	522	567	380	453	524	596	663
Switzerland	—	—	—	—	—	408	491	566	637	701
Taiwan	254	359	458	553	627	339	463	572	655	715

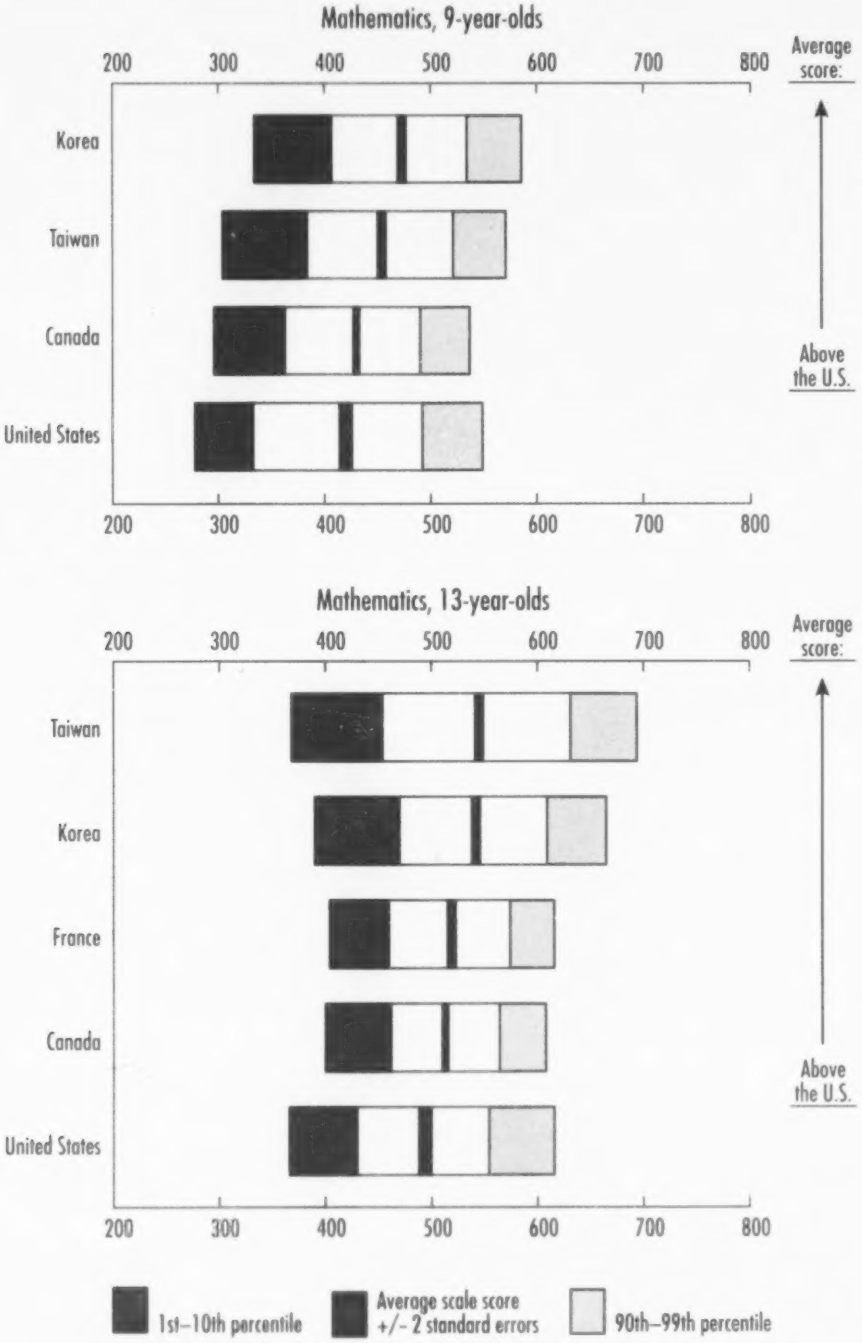
—Did not participate or were excluded (See NOTE for Table 8a).

*No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: Proficiency scores range from 0 to 1000. The mean proficiency score for all participating populations (9- and 13-year-olds together) is 500 and the standard deviation is 100.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1995*, Washington, D.C.: 1995, Indicator 19.

Figure 8a: Average proficiency scores in mathematics, by age and selected country:* 1991

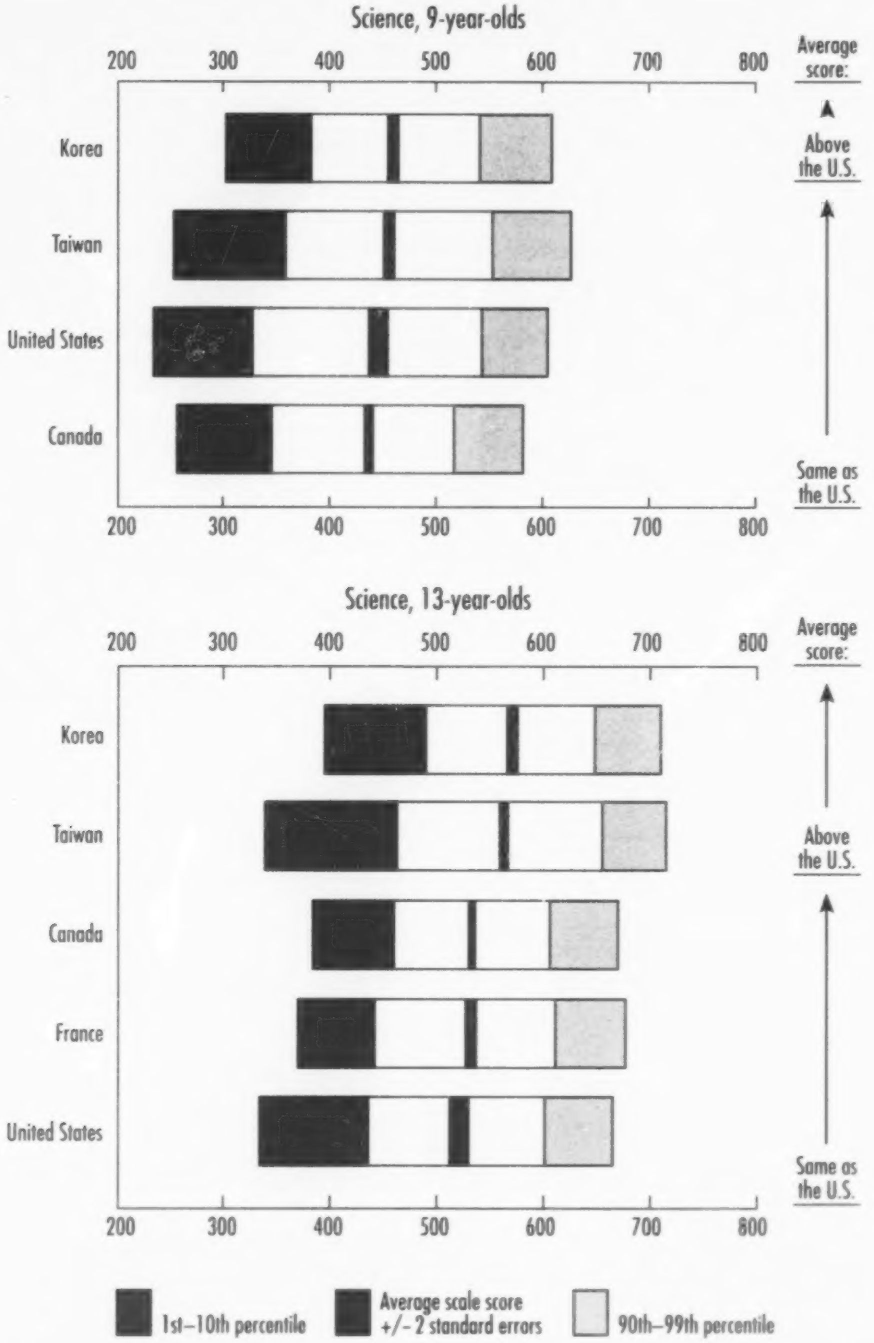

Mathematics, 9-year-olds

Mathematics, 13-year-olds

*Countries are sorted in descending order by average proficiency score.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1995*, Washington, D.C.: 1995, Indicator 18.

Figure 8b: Average proficiency scores in science, by age and selected country:* 1991



*Countries are sorted in descending order by average proficiency score.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1995*, Washington, D.C.: 1995, Indicator 19.

Curricular requirements: mathematics[1]

Curriculum—including the types of classes offered and the material presented in these classes—affects what students learn in mathematics.[2] Mathematics curricula vary significantly between the United States and other nations. In the United States, mathematical content areas tend to be divided among several grades and taught numerous times in an effort to deepen student understanding. This approach builds in repetition in successive grades. In addition, the share of time devoted to various mathematical topics is fairly equally divided in the U.S curriculum.

In contrast, France and Japan typically utilize a curricular structure in which the major piece of a content area is concentrated in a single grade and taught once. There is little room for repetition of concepts across grade levels. Further, these countries tend to place a clear emphasis on selected topics at a given point in a child's education (e.g., Japan's upper-secondary-level curriculum emphasizes calculus), and students receive indepth instruction in these topics at the time they are introduced. Although no research to date has systematically identified which content areas are best taught by each approach, an advantage of the curricular structure adopted by France and Japan is that goals and expectations for each topic are clearly defined. Because in the U.S. curriculum topics are constantly revisited, goals and expectations may have become obscured.

The following example illustrates these differing curricular styles. French students are given intensive instruction in the decimal system at the elementary level and intensive instruction in fractions at the eighth-grade level. However, U.S. students are taught fragments of each topic throughout elementary and junior high school, diminishing the overall curricular intensity and potentially obscuring the basic ideas found in each. Although Japan relies primarily on the concentration approach to teaching mathematical concepts, this reliance is not exclusive. For instance, in Japan decimals and common fractions are taught in grades 3 through 6.

This variation in a country's approach to the coverage of mathematical topic areas is reflected in the results of the Second International Mathematics Study of 1982 (SIMS). While all of the French and U.S. students participating in SIMS were taught fractions by the end of the eighth grade, 40 percent of

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[1] Unless otherwise noted, the discussion and examples contained in this sidebar are based upon two primary sources: (1) the results of the Second International Mathematics Study of 1982 (SIMS) as reported in the following publication: International Association for the Evaluation of Educational Achievement, *The Underachieving Curriculum: Assessing U.S. School Mathematics from an International Perspective* (Champaign, IL: 1989); and (2) Tatsuro, Miwa, "School Mathematics in Japan and the U.S.: Focusing on Recent Trends in Elementary and Lower Secondary School," in National Council of Teachers of Mathematics, *Developments in School Mathematics Education Around the World: Volume 3* (Chicago, IL: University of Chicago Press, 1992).

[2] SIMS collected information from teachers that described their students' opportunity to learn the material covered in the SIMS test.

American eighth-graders could add fractions at the beginning of the school year (fractions are introduced at the elementary level and repeated throughout junior high school in the United States), and only 5 percent of French students could do so at that time. However, by the end of the school year, 73 percent of French eighth-grade students could add fractions, while only 59 percent of U.S. eighth-graders could do so. (In France, fractions receive little attention until that year, when they are covered with a high level of intensity.)

Moreover, SIMS found that in 1982 the United States also differed from France and Japan in terms of the subjects taught to students at a given grade level. While the U.S. eighth-grade-level curriculum was largely devoted to arithmetic with some instruction in algebra, the Japanese focus was on algebra. Similarly, while the U.S. high school curriculum was focused on algebra, the Japanese one was focused on calculus.

Differences in curricular styles also are reflected in textbook formats. For example, while Japanese texts begin with a brief review of the previous year's work, they are based on the assumption that since the material has been covered, it has been learned. In contrast to U.S. textbooks, Japanese texts are short, focus only on key topics, and contain very few worked examples (it is expected that the teacher will supplement the materials with extra explanations and problems).[3]

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[3] Askey, R. "Japanese Grade 7–9 Mathematics." *College Mathematics Journal* 23 (November 1992): 445–448.

Indicator 9: Geography Achievement

Basic literacy in geography provides individuals with an understanding of the geographical context in which all political, environmental, and social events take place. This indicator measures basic geographic skills and knowledge in three areas: geographic skills and tools (e.g., use of maps, charts, globes); physical geography (e.g., locations of physical and topographical features); and cultural geography (e.g., interactions between people and their environment). The assessment reported here provides a rough indication of competencies among 13-year-olds in a limited number of primarily European and North American countries.

- Students in the United States performed in the mid-range of countries participating in a 1991 assessment of geographic knowledge and skills. Student performance ranged from 70 percent correct in Hungary to about 58 percent correct in Scotland and Ireland.
- In all countries,* including the United States, male students outperformed their female counterparts, with differences in Korea ranging up to 7 percentage points.
- In the United States, as in the other participating countries, students scored highest on questions involving map- or chart-reading skills (i.e., skills component). They did less well in identifying physical, topographical, and climatic features (i.e., physical component), and on cultural geography items that required a knowledge of countries, regions, and language groups and an understanding of the interactions between people and their environment.

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*The differences were not significant in the former Soviet Union

Table 9: Average percent correct[1] for 13-year-olds on geography items, by sex, content area, and country: 1991

Country	Total			Content areas		
	Total	Male	Female	Skills	Physical	Cultural
G–7[2]						
Canada	63.0 (0.5)	65.5 (0.6)	60.5 (0.5)	69.5 (0.4)	61.0 (0.6)	58.2 (0.6)
United States	**61.9 (0.8)**	**64.6 (0.8)**	**59.4 (1.0)**	**69.4 (0.6)**	**58.3 (1.0)**	**58.1 (1.0)**
Other						
Hungary	69.8 (0.6)	72.7 (0.7)	67.0 (0.7)	76.3 (0.5)	67.8 (0.7)	65.0 (0.7)
Ireland	58.5 (0.6)	61.4 (0.9)	55.7 (0.7)	62.7 (0.6)	59.5 (0.8)	52.3 (0.8)
Korea	59.7 (0.5)	63.0 (0.7)	55.7 (0.8)	67.8 (0.5)	52.1 (0.7)	60.3 (0.6)
Scotland	58.3 (0.6)	61.0 (0.6)	55.6 (0.8)	66.2 (0.5)	57.1 (0.8)	50.6 (0.8)
Slovenia	65.3 (0.6)	67.8 (0.6)	62.6 (0.8)	67.9 (0.5)	63.6 (0.7)	64.3 (0.9)
Soviet Union (former)	62.6 (1.1)	64.1 (1.1)	61.1 (1.2)	72.2 (0.9)	61.2 (1.0)	53.4 (1.8)
Spain	60.1 (0.7)	63.0 (0.8)	57.3 (0.9)	62.4 (0.9)	58.9 (0.7)	58.9 (1.1)

[1] Standard errors are in parentheses.

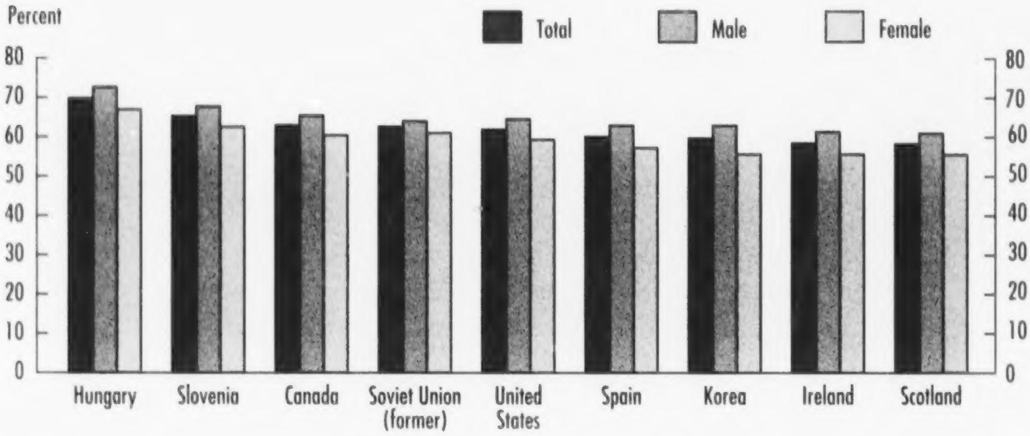
[2] No data available for France, Germany, Italy, Japan, and the United Kingdom.

NOTE: There were three categories of geography items: geographic skills and tools included the use of maps, charts, and globes; physical geography included the location of physical and topographical features and concepts of climate; and cultural geography included the location of cultural entitles (regions, countries, large groups) and interactions between people and their environment.

See supplemental note to Indicator 9 for details on population exclusions.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning About the World*, 1992.

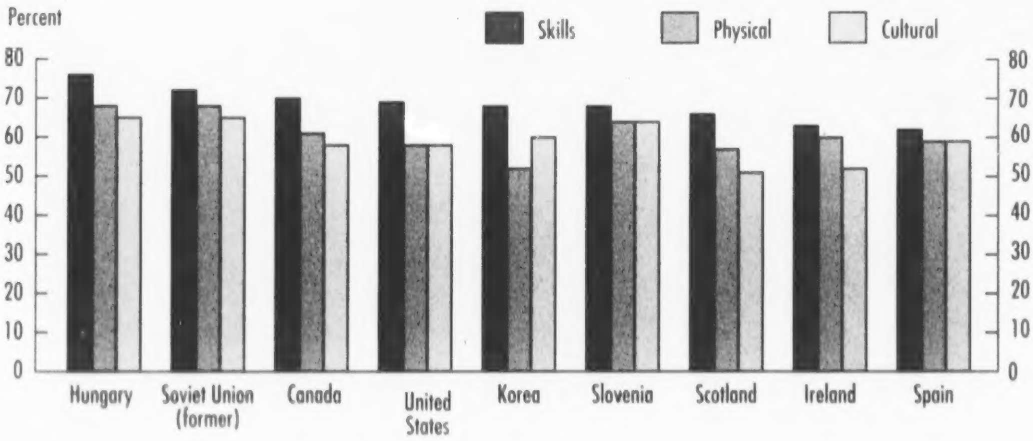
Figure 9a: Average percent correct for 13-year-olds on geography items, by sex and country:* 1991



*Countries are sorted in descending order by average percent correct for the total sample.

SOURCE: Educational Testing Service, the International Assessment of Educational progress, *Learning About the World*, 1992.

Figure 9b: Average percent correct for 13-year-olds on geography items, by content area and country:* 1991



*Countries are sorted in descending order by percent correct on the skills subsection.

SOURCE: Educational Testing Service, The International Assessment of Educational Progress, *Learning About the World*, 1992.

Indicator 10: Adult Literacy

In recent years, adult literacy has come to be seen as one of the fundamental tools necessary for successful economic performance in industrialized societies. Literacy is no longer defined merely in terms of a basic threshold of reading ability. As society becomes more complex and low-skill jobs continue to disappear, the concern about adults' ability to use written information to function in society continues to rise. For the purpose of this indicator, "literacy" is defined as the ability to understand and employ printed information in daily activities—at home, at work, and in the community—to achieve one's goals and to develop one's knowledge and potential. Within countries, literacy levels are affected by both the quality and quantity of the population's formal education, as well as their participation in informal learning activities throughout their lives.

- In 1994, compared with most of the countries assessed, the United States had a greater concentration of adults at the lowest levels of literacy across the prose, document, and quantitative literacy domains. Only in Poland did a greater proportion of the population score at level 1 across all three literacy domains. The United States also had one of the higher concentrations of adults at or above level 4 in all three literacy domains, but most noticeably in the prose domain.
- The proportion of adults at each literacy level was similar across the prose, document, and quantitative domains in Canada and the United States. In Germany, the Netherlands, and Switzerland, however, the proportion of adults scoring at the highest literacy level was greater on the quantitative domain than on the prose domain.
- While in many other countries young adults had higher literacy levels than older adults, distribution of literacy proficiency across different age groups was fairly uniform in the United States, except for adults aged 56 to 65, who scored slightly below other groups. For example, the percentage of U.S. adults aged 26 to 35 scoring at or above level 4 on the prose domain was similar to the percentage of U.S. adults aged 46 to 55 scoring at that level (22 and 24 percent, respectively). In Germany, the younger group was almost twice as likely to score at or above level 4 as the older group (20 percent and 11 percent, respectively). Differences by age in Switzerland, Sweden, and the Netherlands were similar to those of Germany.
- As the level of education increases, the proportion of the population within each country at or above level 4 grows, and the proportion at level 1 decreases. For example, in Canada, 8 percent of those with a lower secondary level of education reached level 4 or above, compared with almost 60 percent of those with a university level of education.

Table 10a: Percentage distribution of the population across literacy levels, by country: 1994

Country	Level 1	Level 2	Level 3	Level 4/5
Prose scale				
G–7*				
Canada	16.6	25.6	35.1	22.7
Germany	14.4	34.2	38.0	13.4
United States	**20.7**	**25.9**	**32.4**	**21.1**
Other				
Netherlands	10.5	30.1	44.1	15.3
Poland	42.6	34.5	19.8	3.1
Sweden	7.5	20.3	39.7	32.4
Switzerland (French)	17.6	33.7	38.6	10.0
Switzerland (German)	19.3	35.7	36.1	8.9
Document scale				
G–7*				
Canada	18.2	24.7	32.1	25.1
Germany	9.0	32.7	39.5	18.9
United States	**23.7**	**25.9**	**31.4**	**19.0**
Other				
Netherlands	10.1	25.7	44.2	20.0
Poland	45.4	30.7	18.0	5.8
Sweden	6.2	18.9	39.4	35.5
Switzerland (French)	16.2	28.8	38.9	16.0
Switzerland (German)	18.1	29.1	36.6	16.1
Quantitative scale				
G–7*				
Canada	16.9	26.1	34.8	22.2
Germany	6.7	26.6	43.2	23.5
United States	**21.0**	**25.3**	**31.3**	**22.5**
Other				
Netherlands	10.3	25.5	44.3	19.9
Poland	39.1	30.1	23.9	6.8
Sweden	6.6	18.6	39.0	35.8
Switzerland (French)	12.9	24.5	42.2	20.4
Switzerland (German)	14.2	26.2	40.7	19.0

*No data available for France, Italy, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 10 for descriptions of the literacy scales and proficiency levels for the International Adult Literacy Survey.

SOURCE: Organization for Economic Co-operation and Development and Statistics Canada, *Literacy, Economy, and Society: Results of the first International Adult Literacy Survey*, 1995.

Table 10b: Percentage distribution of the population across literacy levels, by educational attainment and country: 1994

Country	Prose scale		Document scale		Quantitative scale	
	Level 1	Level 4 or above	Level 1	Level 4 or above	Level 1	Level 4 or above
			Lower secondary			
G–7[*]						
Canada	22.2	8.1	23.2	10.3	23.1	7.8
Germany	17.5	7.9	10.5	12.0	7.6	17.2
United States	**44.7**	**2.8**	**45.2**	**5.9**	**44.7**	**4.5**
Other						
Netherlands	11.9	4.9	11.2	8.8	11.9	10.9
Poland	42.5	1.8	46.9	4.0	39.4	4.1
Sweden	7.0	25.0	68.0	30.8	7.1	31.1
Switzerland (French)	28.9	0.0	31.1	2.1	22.6	4.0
Switzerland (German)	34.2	4.2	31.6	10.3	22.0	12.7
			Upper secondary			
G–7[*]						
Canada	10.0	19.5	10.5	24.1	8.8	16.6
Germany	7.9	14.0	4.7	25.1	4.1	25.7
United States	**16.9**	**13.9**	**21.2**	**12.6**	**18.4**	**14.5**
Other						
Netherlands	2.7	18.8	2.9	26.5	2.7	23.2
Poland	24.9	2.3	27.8	6.8	20.9	10.1
Sweden	5.7	31.1	3.9	34.9	4.8	34.8
Switzerland (French)	11.1	9.1	9.0	14.8	5.6	22.0
Switzerland (German)	11.0	9.8	9.7	16.5	6.9	19.2
			Higher education (nonuniversity)			
G–7[*]						
Canada	4.4	27.7	4.2	39.1	4.2	26.4
Germany	4.1	32.6	4.7	26.8	2.7	26.9
United States	**9.5**	**25.8**	**11.7**	**24.0**	**8.8**	**26.8**
Other						
Netherlands	—	—	—	—	—	—
Poland	11.8	8.6	16.4	12.1	15.5	11.1
Sweden	1.4	45.8	1.1	50.1	0.6	46.3
Switzerland (French)	7.0	10.7	2.0	30.6	3.2	31.2
Switzerland (German)	6.8	9.0	5.1	20.9	3.7	27.9

Table 10b: Percentage distribution of the population across literacy levels, by educational attainment and country: 1994 —Continued

Country	Prose scale Level 1	Prose scale Level 4 or above	Document scale Level 1	Document scale Level 4 or above	Quantitative scale Level 1	Quantitative scale Level 4 or above
			Higher education (university)			
G–7*						
Canada	0.2	59.1	3.3	48.1	2.2	64.0
Germany	4.0	39.6	1.1	46.2	2.0	56.2
United States	**4.9**	**47.5**	**6.7**	**41.1**	**4.9**	**51.8**
Other						
Netherlands	1.3	34.5	1.3	34.9	1.7	39.3
Poland	11.2	16.4	15.6	22.0	9.1	26.5
Sweden	0.7	60.7	0.7	61.4	1.0	63.7
Switzerland (French)	4.8	32.4	4.9	40.1	4.2	41.4
Switzerland (German)	6.7	25.5	6.8	38.4	6.8	38.9

—Data not available.

*No data available for France, Italy, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 10 for descriptions of the literacy scales and proficiency levels for the International Adult Literacy Survey.

SOURCE: Organization for Economic Co-operation and Development and Statistics Canada, *Literacy, Economy, and Society: Results of the first International Adult Literacy Survey*, 1995.

Table 10c: Percentage distribution of the population across literacy levels, by age and country: 1994

Country	Prose scale		Document scale		Quantitative scale	
	Level 1	Level 4 or above	Level 1	Level 4 or above	Level 1	Level 4 or above
			Age 16–25			
G–7*						
Canada	10.7	19.9	10.4	31.0	10.1	16.7
Germany	8.9	15.4	5.2	22.8	4.4	22.0
United States	—	—	—	—	—	—
Other						
Netherlands	8.3	19.5	6.1	26.0	7.7	21.1
Poland	26.7	5.9	32.2	8.5	29.6	6.7
Sweden	3.8	39.7	3.1	40.7	4.9	38.4
Switzerland (French)	10.5	15.4	8.7	26.0	6.2	25.4
Switzerland (German)	7.3	13.8	7.1	26.3	6.9	22.9
			Age 26–35			
G–7*						
Canada	12.3	26.1	13.5	27.5	12.0	27.5
Germany	12.4	19.7	5.9	24.9	4.9	28.9
United States	**19.6**	**21.6**	**21.6**	**21.0**	**20.1**	**23.5**
Other						
Netherlands	6.4	22.5	5.9	29.3	6.7	28.2
Poland	35.0	3.7	39.2	7.4	32.7	8.7
Sweden	4.9	41.7	3.9	47.6	4.0	45.4
Switzerland (French)	11.1	13.0	11.5	21.6	8.8	22.9
Switzerland (German)	16.6	12.0	17.4	23.1	13.1	25.4
			Age 36–45			
G–7*						
Canada	13.3	31.3	13.8	27.4	11.9	30.1
Germany	14.5	14.5	9.5	21.4	6.5	26.3
United States	**19.5**	**29.2**	**23.5**	**25.4**	**18.2**	**31.6**
Other						
Netherlands	8.6	14.3	9.2	17.1	10.1	18.9
Poland	42.0	2.8	42.6	5.7	36.1	8.4
Sweden	7.1	31.7	6.6	35.4	7.0	35.2
Switzerland (French)	22.1	8.9	19.2	13.7	16.6	21.8
Switzerland (German)	24.2	9.1	21.5	12.0	19.0	16.9

Table 10c: Percentage distribution of the population across literacy levels, by age and country: 1994—Continued

	Prose scale		Document scale		Quantitative scale	
Country	**Level 1**	**Level 4 or above**	**Level 1**	**Level 4 or above**	**Level 1**	**Level 4 or above**
			Age 46–55			
G–7*						
Canada	20.6	18.4	23.0	22.4	23.9	19.0
Germany	14.2	10.9	7.4	14.5	7.0	24.7
United States	**18.3**	**23.8**	**21.4**	**17.3**	**19.0**	**23.6**
Other						
Netherlands	13.9	9.8	12.6	13.7	12.8	16.4
Poland	53.5	1.0	55.6	4.1	47.7	5.9
Sweden	8.2	28.2	6.8	30.3	5.8	34.0
Switzerland (French)	20.9	7.9	18.0	9.7	16.1	18.0
Switzerland (German)	19.4	4.2	21.0	10.2	14.8	15.5
			Age 56–65			
G–7*						
Canada	37.6	8.1	43.8	8.7	39.7	7.4
Germany	22.1	4.7	17.7	8.8	10.8	13.5
United States	**23.6**	**14.7**	**29.3**	**11.7**	**22.4**	**16.0**
Other						
Netherlands	20.1	4.7	22.6	6.8	17.6	9.3
Poland	69.5	0.2	70.1	1.4	60.8	2.2
Sweden	15.9	16.2	12.2	18.5	12.9	22.6
Switzerland (French)	27.7	2.3	27.5	4.6	19.2	11.0
Switzerland (German)	30.4	4.1	22.8	6.7	15.8	10.8

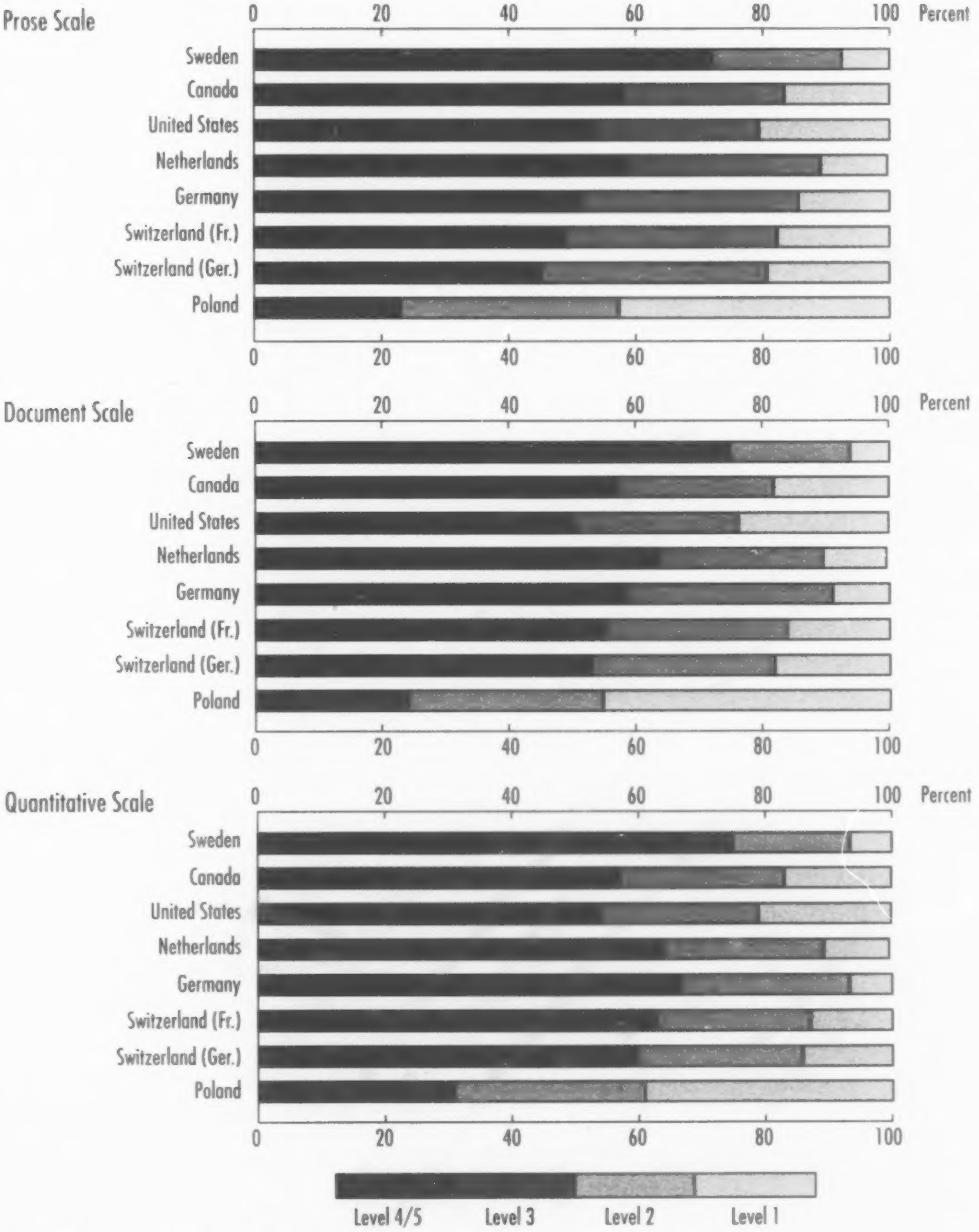
—Data is inaccurate due to problems with sampling this age group and nonresponse.

*No data available for France, Italy, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 10 for descriptions of the literacy scales and proficiency levels for the International Adult Literacy Survey.

SOURCE: Organization for Economic Co-operation and Development and Statistics Canada, *Literacy, Economy, and Society: Results of the first International Adult Literacy Survey*, 1995.

Figure 10a: Percentage distribution of the population across literacy levels, by country:[1,2] 1994



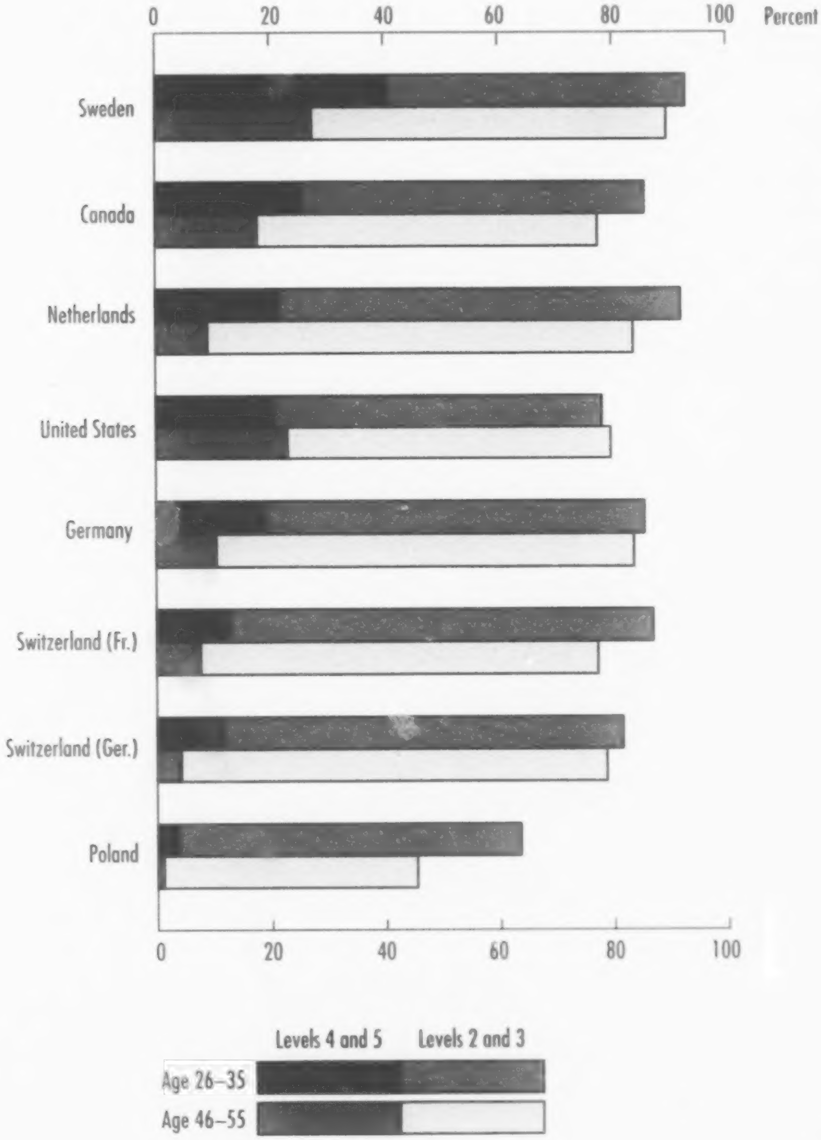
[1] Data not available for France, Italy, Japan, and the United Kingdom.

[2] Countries are sorted in descending order by percentage of the population at literacy levels 4/5 (prose scale only).

NOTE: This chart reads as follows: on the prose scale, 32 percent of adults in Sweden reached level 4 or higher, 72 percent reached level 3 or higher, 92 percent reached level 2 or higher, and 100 percent reached level 1 or higher. For corresponding numbers, see table 10a.

SOURCE: Organization for Economic Co-operation and Development and Statistics Canada, *Literacy, Economy, and Society: Results of the first International Adult Literacy Survey*, 1995.

Figure 10b: Percentage distribution of the population across literacy levels (prose scale), by age and country:[1,2] 1994



[1] Data not available for France, Italy, Japan, and the United Kingdom.

[2] Countries are sorted in descending order by percentage of the 26- to 35-year-olds' population in literacy levels 4 and 5 (prose scale only).

NOTE: The chart reads as follows: Almost 42 percent of adults aged 26–35 from Sweden attained level 4 or higher on the prose literacy scale, and another 53 percent reached levels 2 or 3. For corresponding numbers, see table 10c.

SOURCE: Organization for Economic Co-operation and Development and Statistics Canada, *Literacy, Economy, and Society: Results of the first International Adult Literacy Survey*, 1995.

International adult literacy

The information contained in this sidebar is taken from the Introduction and Chapter 2 of: Organization for Economic Co-operation and Development and Statistics Canada, *Literacy, Economy, and Society: Results of the first International Adult Literacy Survey,* 1995.

This indicator reports the results of a wide-ranging test of literacy skills given to a large sample of adults (ranging from 1,500 to 1,800 per country) in Europe and North America during the autumn of 1994. The International Adult Literacy Survey (IALS) was a collaborative effort by seven governments and three intergovernmental organizations. Each country was required to draw a probability sample from which results representative of the civilian, noninstitutionalized population aged 16–65 could be derived. In six countries, the survey was carried out in the national language; in Canada, respondents were given a choice of English or French; in Switzerland, samples drawn from French-speaking and German-speaking cantons were required to respond in those respective languages.

As literacy cannot be narrowed down to a single skill suited for dealing with all types of text, nor defined as an infinite set of skills, the IALS defined literacy in terms of three domains, each encompassing a common set of skills relevant for diverse tasks:

- Prose literacy—the knowledge and skills required to understand and use information from texts including editorials, news stories, poems, and fiction;
- Document literacy—the knowledge and skills required to locate and use information contained in various formats, including job applications, payroll forms, transportation schedules, maps, tables, and graphics; and
- Quantitative literacy—the knowledge and skills required to apply arithmetic operations, either alone or sequentially, to numbers embedded in printed materials, such as balancing a checkbook, figuring out a tip, completing an order form, or determining from an advertisement the amount of interest on a loan.

In each of these three domains, rather than expressing a threshold for achieving literacy, a scale from 0 to 500 was constructed, upon which tasks of varying difficulty were placed. These scales were developed through the item response theory (IRT) scaling procedures. First, the difficulty of tasks was ranked on the scale according to how well respondents actually performed on them. Then, each scale was divided into five levels reflecting the empirically determined progression of information-processing skills and strategies.[1] Next, individuals were assigned scores between 0 and 500 according to how well they did on a variety of tasks at different levels. Finally, the percentage of readers falling into each skill level was calculated.

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[1] I. Kirsh, A. Jungeblut, and P. Mosenthal, *Moving toward the Measurement of Adult Literacy* (Washington, D.C.) U.S. Department of Labor, forthcoming.

A person's literacy ability in each domain can be expressed by a score, defined as the point at which he or she has an 80-percent chance of successfully performing a given task. If a person's score places him or her in level 2, it means that he or she has an 80-percent chance of successfully performing level 2 tasks and a greater than 80-percent chance of performing level 1 tasks. It does not mean, however, that individuals with low proficiency can never succeed at more difficult tasks (that is, at tasks that are rated at higher skill levels). It means only that their probability of success is relatively low.

Indicator 11: Education Attainment

The education attainment of a country's population reflects the availability of education in the country and provides an indirect measure of the country's commitment to the skills development of its citizens. Because many working-age adults completed their education years ago, the indicator is influenced by changes over time in the characteristics of an education system. Countries that have undergone major expansions in education only in recent years will still have a large proportion of relatively uneducated adults.

- Of the G–7 countries for which data were available in 1992, the United States, Canada, and Germany had the highest proportion of adults aged 25–64 having completed at least upper secondary education (roughly equivalent to high school in the United States).* At least 70 percent of U.S., Canadian, and German adults 25–64 years of age had completed at least upper secondary education. Among Italians aged 25–64, 28 percent completed at least upper secondary education. Of the other countries listed in the table, only Czechoslovakian, Norwegian, Swiss, and Swedish adults attained levels of upper secondary education comparable to those of the United States and Germany.
- Of the G–7 countries, Canada and the United States had, by far, the highest proportion of 25- to 64-year-olds having completed higher education (41 and 31 percent, respectively). Less than 25 percent of the 25- to 64-year-olds in the other G–7 countries and the remaining countries listed in the table (with the exception of Norway) had completed this level. In fact, only 6 percent of 25- to 64-year-olds in Italy completed higher education.

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*For further explanation of the levels of education, see the sidebar entitled *ISCED levels of education*.

Table 11: Percentage of the population 25–64 years of age that has completed a specific highest level of education, by country: 1992

Country	Lower secondary and below	Upper secondary	Higher education
G–7			
Canada	29	30	41
France	48	36	16
Germany	18	60	22
Italy	72	22	6
Japan[1]	30	48	21
United Kingdom	32	49	19
United States	**16**	**53**	**31**
Other			
Australia[2]	47	30	23
Austria	32	61	7
Belgium	55	25	20
Czechoslovakia[3]	27	63	10
Denmark	41	40	19
Finland	39	43	18
Ireland	58	25	17
Netherlands	42	37	21
New Zealand	43	33	24
Norway	21	54	25
Portugal	86	7	7
Spain	77	10	13
Sweden	30	46	24
Switzerland	19	60	21
Turkey	86	9	5

[1] 1989 data. Row values do not total 100 since 1 percent were classified as "other."

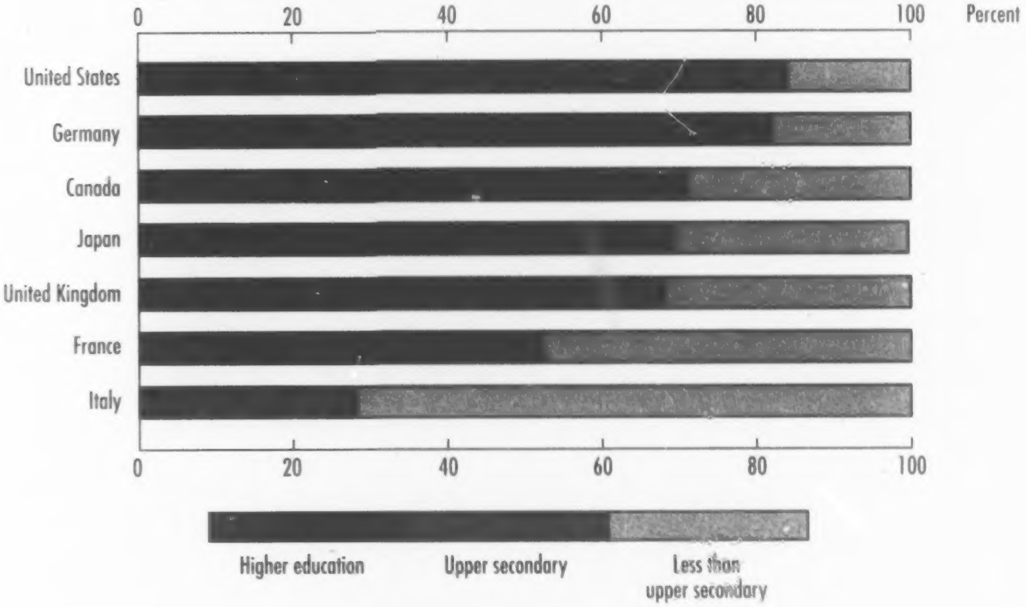
[2] 1993 data.

[3] 1991 data.

NOTE: See supplemental note to Indicator 11 for details on indicator calculation for Australia, Austria, Belgium, Canada, Czechoslovakia, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 11: Percentage of the population 25–64 years of age that has completed a specific highest level of education, by G–7 country:[1] 1992



[1] Countries are sorted in descending order by the percentage of 25- to 64-year-olds having completed upper secondary, or higher education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 12: Upper Secondary Education Attainment

Completion of at least an upper secondary level of education*—roughly equivalent to completing high school in the United States—provides an indirect measure of a nation's total supply of citizens with specific educational knowledge and skills and, hence, some indication of the country's capacity for sustained economic growth and competitiveness. Reporting the education attainment levels of different age cohorts provides some indication of how a country's educational opportunities have expanded over time.

- Of the G–7 countries compared in 1992, the United States, Canada, Germany, and the United Kingdom each reported that more than 75 percent of 25- to 34-year-olds had completed at least an upper secondary level of education. Italy was the only G–7 country reported in which fewer than 50 percent of 25- to 34-year-olds had completed at least an upper secondary level of education.
- The percentage of adults having completed at least an upper secondary level of education generally increased with each successively younger age cohort. However, the magnitude of the increase differed across countries. Of the G–7 countries compared, the difference between the youngest and oldest age groups ranged from 14 percentage points in the United States to 38 percentage points in France. Of the remaining countries, Finland had the largest difference (51 percentage points) and New Zealand had the smallest (11 percentage points).
- In addition, the absolute levels of education attainment differed considerably across countries, particularly among the older age groups. Excluding Portugal and Turkey, there was more variation in upper secondary education attainment across countries at ages 55–64 than at ages 25–34. For instance, in the United States, upper secondary attainment for 55- to 64-year-olds was 73 percent—the highest attainment rate for this age cohort among all the countries reported. Within the G–7 countries reported, Italy had the lowest upper secondary education attainment for 55- to 64-year-olds, 12 percent. Thus, the difference in attainment between these two countries at ages 55–64 was 61 percentage points, and the difference at ages 25–34 was 45 percentage points.

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*For further explanation of the levels of education, see the sidebar entitled *ISCED levels of education*.

Table 12: Percentage of the population within various age groups having attained at least an upper secondary level of education, by country: 1992

Country	Age group			
	25–34	35–44	45–54	55–64
G-7[1]				
Canada	81	78	66	49
France	67	57	47	29
Germany	89	87	81	69
Italy	42	35	21	12
United Kingdom	81	71	62	51
United States	**87**	**88**	**83**	**73**
Other				
Australia[2]	57	56	51	42
Austria	79	71	65	50
Belgium	60	52	38	24
Czechoslovakia[3]	87	79	68	51
Denmark	67	61	58	45
Finland	82	69	52	31
Ireland	56	44	35	25
Netherlands	68	61	52	42
New Zealand	60	58	55	49
Norway	88	83	75	61
Portugal[3]	21	17	10	7
Spain	41	24	14	8
Sweden	83	76	65	48
Switzerland	87	84	78	70
Turkey	21	14	9	5

[1] No data available for Japan.

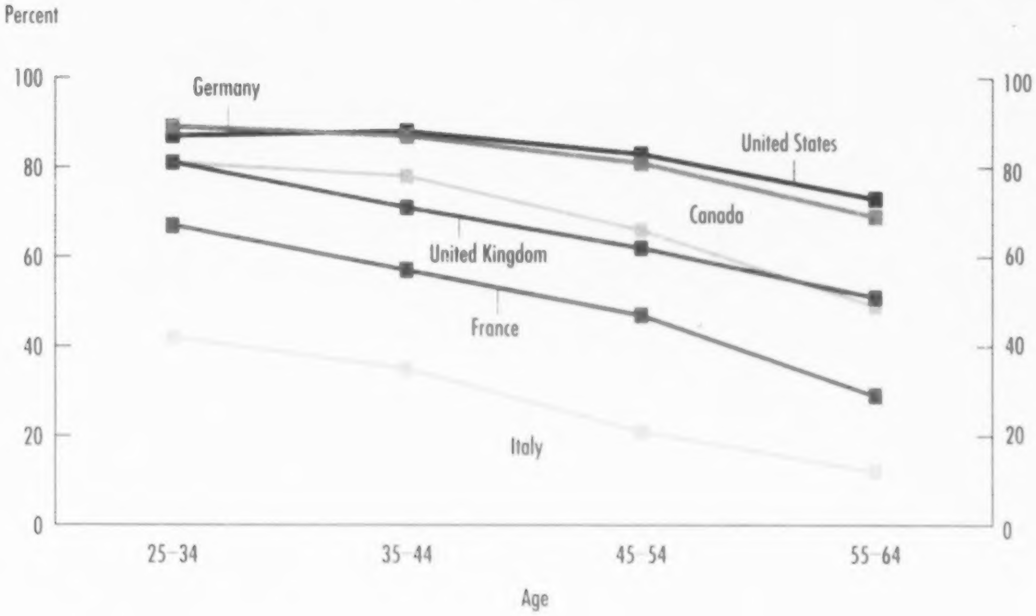
[2] 1993 data.

[3] 1991 data.

NOTE: See supplemental note to Indicator 11 for details on indicator calculation for Australia, Austria, Belgium, Canada, Czechoslovakia, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 12: Percentage of the population within various age groups having completed at least an upper secondary level of education, by G–7 country:* 1992



*No data available for Japan.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 13: Education Attainment for Females

The percentage of females among adults aged 25–64 who have attained specific levels of education provides an indication of sex differences in the levels of education attained by adults and, consequently, the differential skill levels that males and females bring to the workforce. A value of 50 indicates that males and females are equally represented in the population that has attained a specific level of education, whereas a value less than 50 indicates that there are fewer females than males at a given level. Since education is a major determinant of labor market qualifications and participation, income, occupational mobility, and quality of life, large sex differences in education attainment favoring males imply that females on average are at a major disadvantage in the world of work and in society.

- In all of the countries reported (G–7 and other), females aged 25–64 were systematically underrepresented in university higher education and were frequently overrepresented at the lower education levels as of 1992. To illustrate, 68 percent of Germans whose highest level of education attainment was lower secondary* or less were female, in contrast to only 35 percent of those individuals attaining university-level higher education. In the United Kingdom, the figures were 59 and 36 percent, respectively. Compared with most of the countries reported here, the sex differences in education attainment were small in the United States (50 percent for lower secondary or less and 46 percent university education).
- The sex difference in university-level education attainment was relatively smaller for 25- to 34-year-olds than it was for 25- to 64-year-olds in the G–7 countries reported and was practically eliminated in the United States, Canada, France, and Italy, indicating a narrowing of the sex difference in university-level education attainment. (See supplemental tables 2 and 3.)
- In many countries, attaining a nonuniversity higher education was predominantly either a male or a female achievement. In France, the United Kingdom, the United States, Belgium, Denmark, New Zealand, and Portugal, a substantially greater proportion of females than males attained nonuniversity higher education, whereas in Germany, Spain, and Switzerland, the reverse was true. Of the G–7 countries for which data were available, only Canada had equal proportions of males and females at this education level. These patterns may be due in part to differences in the education level at which training for traditionally male and female occupations is concentrated.

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*For further explanation of levels of education, see the sidebar entitled *ISCED levels of education*.

Table 13: Women as a percentage of the total population 25–64 years of age who have completed specific levels of education, by highest level of education completed and country: 1992

Country	Lower secondary and below	Upper secondary	Higher education (nonuniversity)	Higher education (university)	Population aged 25–64
G–7[1]					
Canada	50	55	50	45	51
France	55	46	56	46	51
Germany	68	49	35	35	49
Italy	52	48	(2)	43	51
United Kingdom	59	46	60	36	50
United States	**50**	**53**	**56**	**46**	**51**
Other					
Australia[3]	61	35	50	45	50
Austria	65	43	(2)	43	50
Belgium	51	47	60	34	50
Czechoslovakia[4]	66	46	(2)	40	51
Denmark	55	43	57	47	49
Finland	49	52	52	42	50
Ireland	47	58	54	41	50
Netherlands	56	45	(2)	21	49
New Zealand	57	39	68	40	51
Norway	51	50	51	40	49
Portugal[4]	52	46	74	48	52
Spain	53	46	34	48	51
Sweden	47	50	54	46	49
Switzerland	66	52	25	32	50
Turkey	52	34	(2)	30	50

[1] No data available for Japan.

[2] Data included in another category.

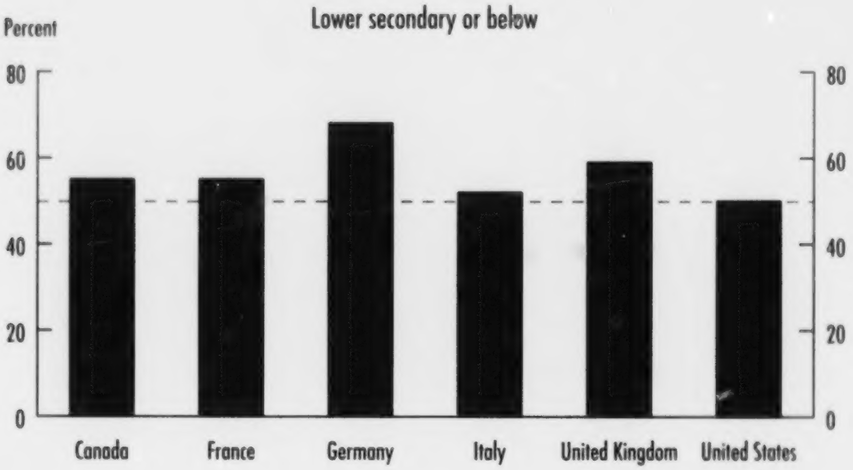
[3] 1993 data.

[4] 1991 data.

NOTE: See supplemental tables 2 and 3 for additional data on sex differences in education attainment. See supplemental note to Indicator 13 for details on indicator calculation for Australia, Austria, Belgium, Canada, Czechoslovakia, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project 1995.

Figure 13: Women as a percentage of the total population 25–64 years of age who have completed various levels of education, by highest level of education completed and G–7 country:[1,2] 1992



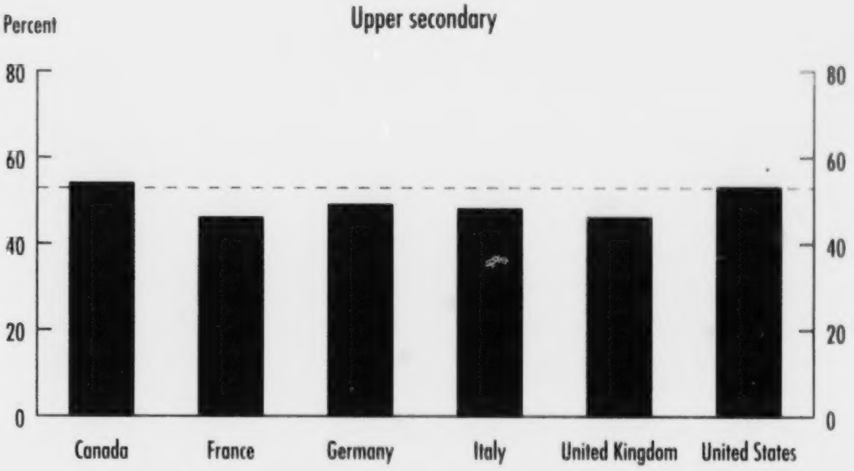
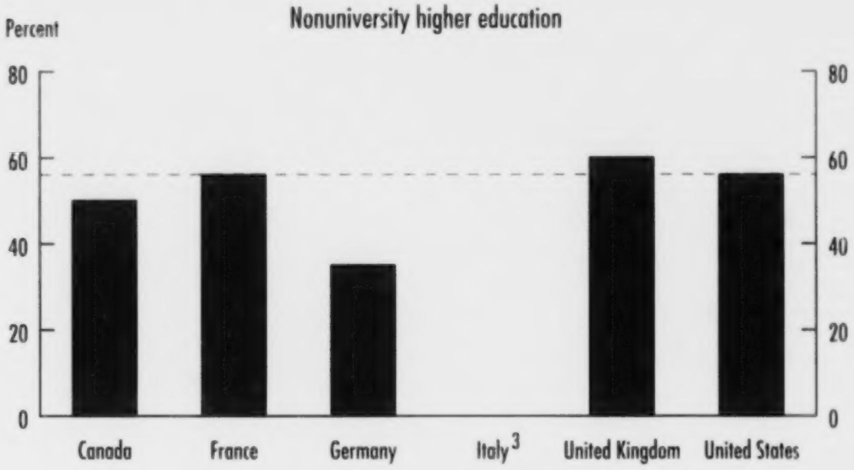
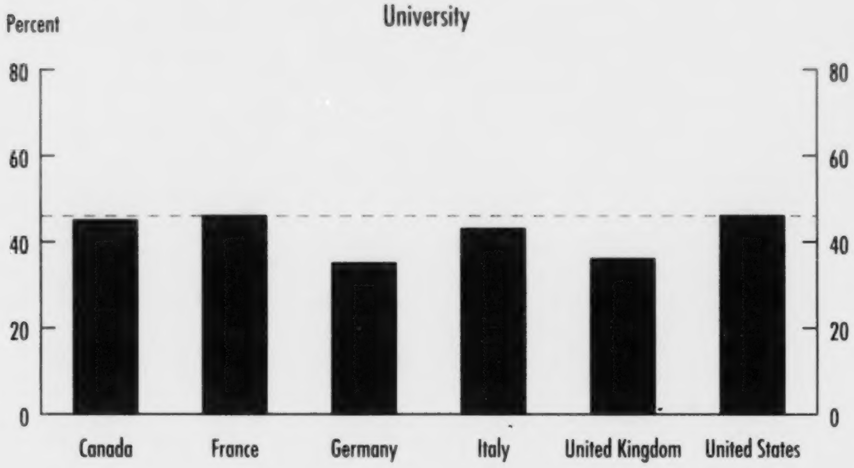


Figure 13: **Women as a percentage of the total population 25–64 years of age who have completed various levels of education, by highest level of education completed and G–7 country:[1,2] 1992 —Continued**





[1] No data available for Japan.

[2] Countries are reported in alphabetical order.

[3] Data included in another category.

NOTE: A value of 50 indicates equal proportions while a value less than 50 reveals that there are fewer women than men at a given level of education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 14: Science and Engineering Degrees (As a Percentage of All Degrees)

The percentage of all university degrees* awarded that are in science and engineering fields reflects the relative emphasis an education system places on training scientists and engineers. Science and engineering degrees are conferred upon students with skills highly valued in commerce and business, especially in a time when technological superiority is increasingly related to international market competitiveness. Science graduates as a proportion of the labor force aged 25–34 provides a measure of the availability of scientific resources and technical skills available to a country.

- In the United States, science and engineering degrees comprised a smaller percentage of all university degrees awarded than in most other countries with available data in 1992 (G–7 and other). Of the G–7 countries for which statistics on 1992 university degree awards were available, a smaller percentage of all university degrees in the United States, Canada, and Italy were granted in science and engineering fields (around 16 percent) than were awarded in Germany, the United Kingdom, and Japan (between 25 and 33 percent).
- As far as individual categories of science degrees are concerned, among all the countries reported here, only Australia, the Czech Republic, Denmark, and Turkey awarded fewer physical science degrees as a percentage of all degrees than did the United States; and only Canada, Australia, and New Zealand awarded fewer engineering degrees as a percentage of all degrees than did the United States.
- In all countries surveyed with the exception of Australia and New Zealand, engineering degrees comprised the largest share of scientific degrees awarded. A greater proportion of scientific degrees awarded were in the biological sciences in Australia and New Zealand.
- Science graduates as a proportion of the labor force aged 25–34 varied significantly across the G–7 countries for which 1992 data were available. Italy had far fewer science graduates in 1992 per 100,000 25- to 34-year-olds in the labor force (187) than did the other G–7 countries, and Japan and the United Kingdom had far more (974 and 989, respectively).

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*This indicator includes all university-level degrees, including the doctorate. It should be taken into consideration that some countries award two degrees prior to the doctorate, whereas others award only one. Moreover, some countries have a long initial degree and few possibilities for pursuing subsequent ones.

Table 14: Science and engineering degrees as a percentage of all university degrees awarded and science graduates as a proportion of the labor force, by country: 1992

Country	Biological sciences	Physical sciences	Mathematics and computer science	Engineering	All scientific degrees	Science graduates per 100,000 persons aged 25–34 in the labor force
G–7[1]						
Canada	3.9	2.6	3.5	6.1	16.2	668
West Germany (former)	3.3	6.2	4.2	19.2	32.9	650
Italy	3.4	2.7	3.4	7.1	16.6	187
Japan[2]	—	3.8	—	21.6	25.4	974
United Kingdom	4.1	5.8	6.1	13.0	29.0	989
United States	**3.4**	**1.8**	**3.6**	**7.2**	**16.0**	**688**
Other						
Australia	8.4	1.1	3.9	5.1	18.5	922
Czech Republic	2.0	0.7	0.8	32.5	36.0	—
Denmark	3.7	0.2	1.5	15.8	21.2	683
Finland	1.6	3.4	6.7	23.2	35.0	792
Hungary[3]	3.2	—	—	15.2	18.4	—
Ireland	3.2	8.6	5.0	11.8	28.6	951
Netherlands	0.7	1.9	3.0	15.0	20.6	691
New Zealand	5.8	—	3.3	3.7	12.9	453
Norway	1.2	1.6	3.2	20.6	26.7	855
Spain	2.5	3.3	3.4	8.0	17.2	558
Sweden	2.1	3.2	5.4	15.9	26.6	458
Switzerland	6.5	6.9	3.1	7.4	23.9	302
Turkey	1.7	1.2	1.6	15.2	19.6	—

—Not available.

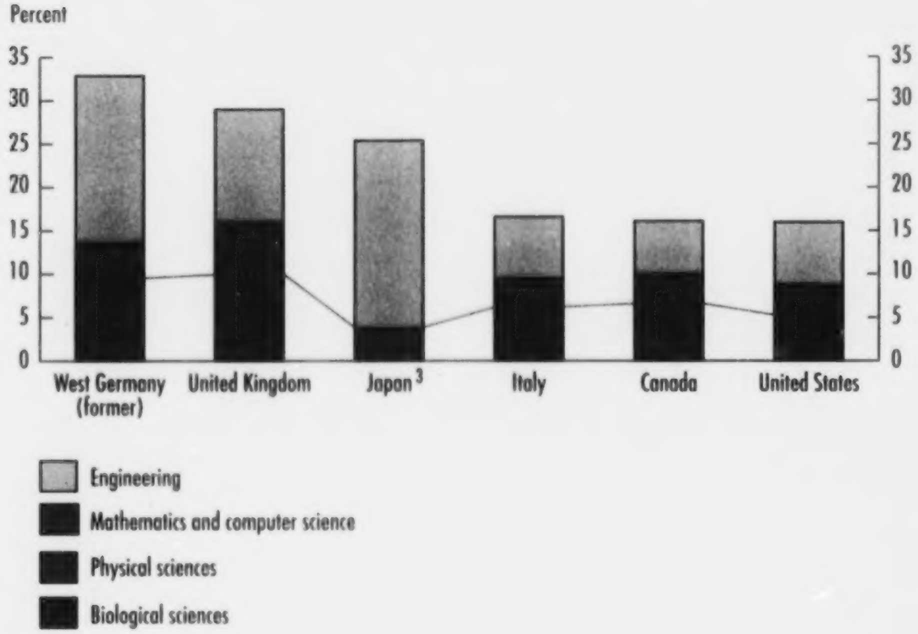
[1] No data available for France.

[2] Biological sciences included in physical sciences. Mathematics and computer science included in engineering.

[3] Physical science, mathematics, and computer science are included in biological sciences.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 14a: Science and engineering degrees as a percentage of all university degrees awarded, by G–7 country:[1,2] 1992



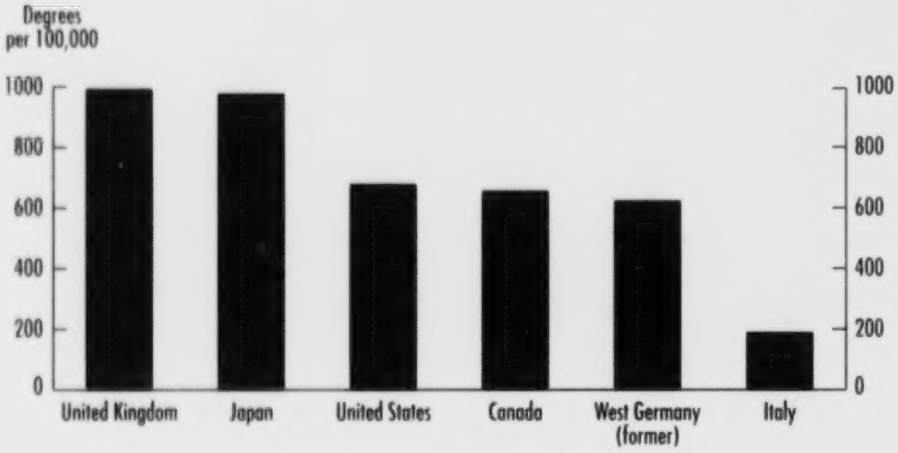
[1] No data available for France.

[2] Countries are sorted in descending order by (the percentage of total) science and engineering degrees as a percentage of all university degrees awarded.

[3] Mathematics and computer science included in engineering and biological sciences included in physical sciences.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 14b: Science degrees awarded per 100,000 25- to 34-year-olds in the labor force by G–7 country:* 1992



*No data available for France.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

EDUCATION AND LABOR MARKET DESTINATIONS

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EDUCATION AND LABOR MARKET DESTINATIONS

Preparing students for work is an important objective of formal education systems. From the perspective of both the individual and society, returns in the labor market are a major goal of investment in education. In the United States, as well as in other countries, public policy calls on the education system to address labor market problems. Most recently in the United States, this has been evident in the passage of the School-to-Work Opportunities Act of 1994.

The indicators presented in this section confirm the linkage between education attainment and labor market outcomes and, in fact, reveal that labor market returns for investing in formal education are even more pronounced in the United States than in many other countries. In all of the countries reported, labor market participation increased in conjunction with education (Indicator 15). Furthermore, in the United States as well as in the other countries, the unemployment rate of labor market participants decreased as education level increased (Indicator 19). Finally, education is also an important factor affecting earnings, with more education generally leading to higher earnings (Indicator 17).

In all of the countries reported, labor market participation and average annual earnings of females were below those of males, even when education level was held constant (Indicators 16 and 18). This may be due, at least in part, to the higher incidence of part-time work among females than among males and to sex differences in the total number of years in the labor force. Furthermore, the relationship between education and labor market outcomes was different for males and females, as earnings correlated more strongly to education for females than for males, often resulting in more similar outcomes for males and females with a university education than for those with less education. To illustrate, females received larger returns than males for a university education in about half of the countries reported, including the United States (Indicator 17).

The relationship between education and labor market participation was especially marked for females in most countries, including the United States. As a result, the gap between male and female participation decreased as educational attainment increased (Indicator 16). The same was true for the relationship between education and earnings among young adults (aged 25–34). Average annual earnings of females were closer to the earnings of males for young adults with a university education than for those with less education (Indicator 18). It appears, then, that there is a greater incentive for females to pursue higher levels of education than males since the labor market payoffs (i.e., participation and earnings) for higher levels of education are more pronounced for females than males.

However, for more than half the countries, the labor force participation rate for males with a university education was still from 10 to 15 percentage points higher than the female rate (Indicator 16). In addition, females in all countries continued to earn less than males with the same level of education. Also, among older adults (aged 45–64), education had little relationship to the ratio of mean annual earnings of females to males (Indicator 18).

Indicator 15: Labor Force Participation and Education

The percentage of 25- to 64-year-olds who are either employed or actively seeking work provides an indication of participation in a country's labor force. Participation rates differ among countries for several reasons, including the social and economic organization of labor markets and cultural attitudes regarding work. Workforce participation is also related to the age structure and education attainment levels of the population, with older adults and those with less education typically joining the labor force at lower rates. Also, full-time enrollment in an education program limits labor force participation.

- Of the G–7 countries for which 1992 data were available, five had similar labor force participation rates, ranging from 75 percent in France to 79 percent in the United States. The one exception was Italy, whose rate was a much lower 65 percent.
- In all the countries reported, labor force participation rates increased with the level of education attainment. For instance, 60 percent of U.S. 25- to 64-year-olds with a lower secondary education* or below were in the labor force. For 25- to 64-year-olds with an upper secondary education, nonuniversity higher education, or university education, the labor force participation rates in the United States were 80, 87, and 88 percent, respectively. At the university level, almost all of the countries had labor force participation rates that approached or exceeded 90 percent.
- Compared with the United States, whose labor force participation rates at lower secondary and below and at upper secondary education were 60 and 80 percent, respectively, France (65, 84), the United Kingdom (65, 82), Portugal (65, 88), and the Nordic countries (e.g., Sweden, with rates of 86 and 93) had slightly higher rates.

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* For further explanation of education levels, see the sidebar entitled *ISCED levels of education*.

Table 15: Labor force participation rate for 25- to 64-year-olds, by highest level of education completed and country: 1992

Country	Lower secondary and below	Upper secondary	Higher education (nonuniversity)	Higher education (university)	Higher education total
G–7[1]					
Canada	62.4	79.9	85.5	89.6	77.8
France	64.9	83.5	89.4	86.9	75.3
Germany	57.0	76.7	86.5	89.8	75.6
Italy	58.2	79.8	([2])	90.7	65.1
United Kingdom	64.5	82.1	84.0	90.3	77.5
United States	**60.3**	**79.7**	**86.7**	**88.4**	**79.2**
Other					
Australia	65.1	80.2	83.2	89.2	74.4
Austria	52.8	73.9	([2])	88.4	68.1
Belgium	56.1	78.8	85.3	88.9	68.0
Denmark	73.0	88.9	93.4	93.7	83.3
Finland	69.8	84.7	85.7	91.8	79.8
Ireland	57.3	70.7	81.9	87.9	65.2
Netherlands	55.4	77.0	([2])	85.5	69.7
New Zealand	67.0	79.1	80.9	89.5	75.2
Norway	65.0	83.2	88.8	93.3	81.4
Portugal	65.1	88.4	91.0	95.2	68.8
Spain	57.6	80.2	89.0	86.4	63.7
Sweden	86.2	93.0	94.3	95.2	91.4
Switzerland	71.7	82.2	91.9	92.7	82.3
Turkey	58.3	74.7	([2])	90.2	61.3

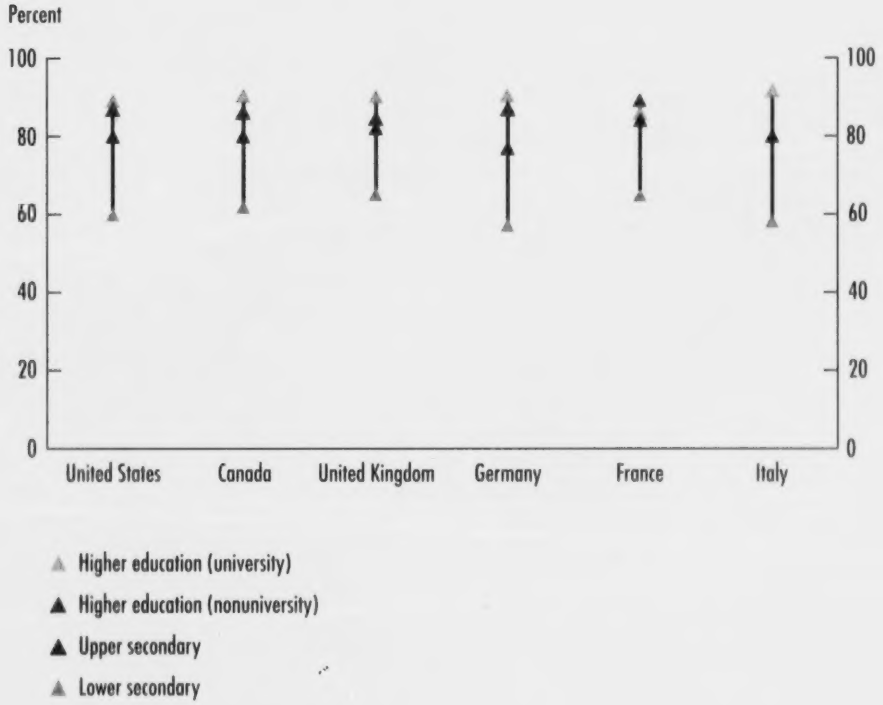
[1] No data available for Japan.

[2] Data included in another category.

NOTE: See supplemental note to Indicator 15 for details on indicator calculation for Australia, Austria, Belgium, Canada, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 15: **Labor force participation rate of persons 25–64 years of age who have attained various levels of education, by the highest level of education completed and G-7 country:[1,2] 1992**



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[1] No data available for Japan.

[2] Countries are sorted in descending order by overall labor force participation rate.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 16: Labor Force Participation of Males and Females

Indicator 16 shows labor force participation rates by education level separately for men and women. The continued prevalence in many countries of the tradition of women not working outside the home because of family responsibilities and differing cultural attitudes toward women in the workforce are two factors that influence their labor force participation rates.

- For all the countries reported, female labor force participation rates were lower than comparable rates for males in 1992. In the United States, the labor force participation rate for 25- to 64-year-old males was 89 percent, while the participation rate for females was 70 percent, a gap of 19 percentage points. In the G–7 countries, this gap between male and female participation ranged from 18 percentage points in Canada to 38 percentage points in Italy.
- The relationship between education and labor force participation—the higher the level of education, the higher the level of participation—was especially marked for women. In the United States, for example, the participation rates were 36 percentage points higher for women who completed university-level higher education than for women with only a lower secondary education* or below. The corresponding difference for men was 19 percentage points. In Italy, the differences were even more pronounced: a 50 percentage point spread for women at opposite ends of the educational spectrum versus 12 percentage points for men.
- As a result of the stronger relationship between education and labor force participation for women, the gap between male and female participation tended to decrease as education attainment increased. For example, the sex difference in labor force participation was about 30 percentage points at the lower secondary level, and about 12 percentage points at the university level in the United States.

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*For further explanation of education levels, see the sidebar entitled *ISCED levels of education*.

Table 16: Labor force participation rate for individuals 25–64 years of age, by highest level of education attainment, sex, and country: 1992

	Lower secondary and below		Upper secondary		Higher education (nonuniversity)		Higher education (university)		Total	
Country	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
G–7[1]										
Canada	76.2	48.5	89.4	72.0	91.4	79.6	93.8	84.3	86.8	68.9
France	77.4	54.6	90.6	74.9	95.4	84.7	91.2	81.9	85.1	65.7
Germany	80.2	46.1	85.6	67.3	89.4	80.9	93.8	82.4	86.7	64.2
Italy	81.8	36.6	89.6	69.3	(2)	(2)	93.9	86.4	84.5	46.2
United Kingdom	79.4	54.2	91.1	71.4	93.2	77.7	94.2	83.6	88.6	66.4
United States	**75.2**	**45.6**	**89.8**	**70.7**	**94.1**	**81.0**	**93.8**	**82.2**	**88.7**	**70.0**
Other										
Australia	82.9	53.4	89.8	62.2	90.7	75.7	94.8	82.3	88.0	60.8
Austria	71.6	42.8	83.6	61.1	(2)	(2)	93.1	82.0	81.7	54.7
Belgium	73.4	39.7	88.9	67.5	92.5	80.4	91.8	83.4	81.3	54.6
Denmark	78.8	68.3	90.8	86.6	94.1	92.8	94.9	92.3	87.1	79.4
Finland	73.1	66.4	89.5	80.1	89.2	82.4	93.4	89.4	83.6	75.9
Ireland	82.4	29.2	93.4	54.3	94.3	71.4	93.6	79.8	86.5	43.9
Netherlands	77.1	38.4	88.5	63.2	(2)	(2)	91.3	77.4	85.0	53.8
New Zealand	82.2	55.5	87.5	65.8	90.9	75.9	95.0	81.0	86.8	63.8
Norway	75.3	55.1	89.8	76.7	91.0	86.6	95.9	89.2	87.9	74.6
Portugal	83.3	48.4	91.1	85.2	91.1	91.0	96.0	94.4	84.7	54.0
Spain	82.9	34.8	92.2	65.9	95.3	76.7	90.5	81.9	85.2	42.9
Sweden	90.8	81.0	94.8	91.2	94.7	93.9	96.1	94.1	93.7	89.1
Switzerland	91.8	61.3	95.5	70.2	96.3	78.8	97.6	82.1	95.4	69.1
Turkey	87.6	31.4	92.1	41.3	(2)	(2)	93.6	82.2	88.5	33.4

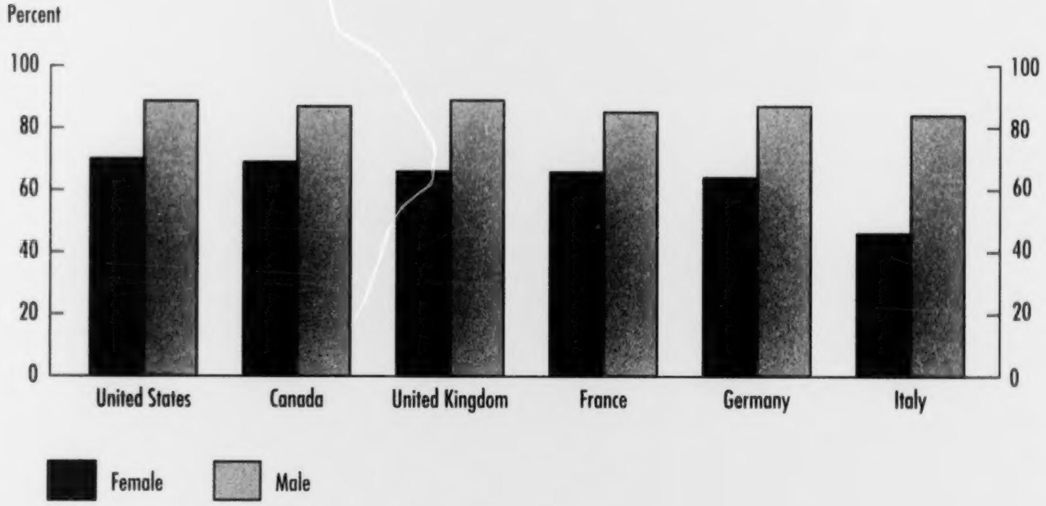
[1] No data available for Japan.

[2] Data included in another category.

NOTE: See supplemental note to Indicator 16 for details on indicator calculation for Australia, Austria, Belgium, Canada, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 16a: Labor force participation rate of 25- to 64-year-old males and females, by G–7 country:[1,2] 1992

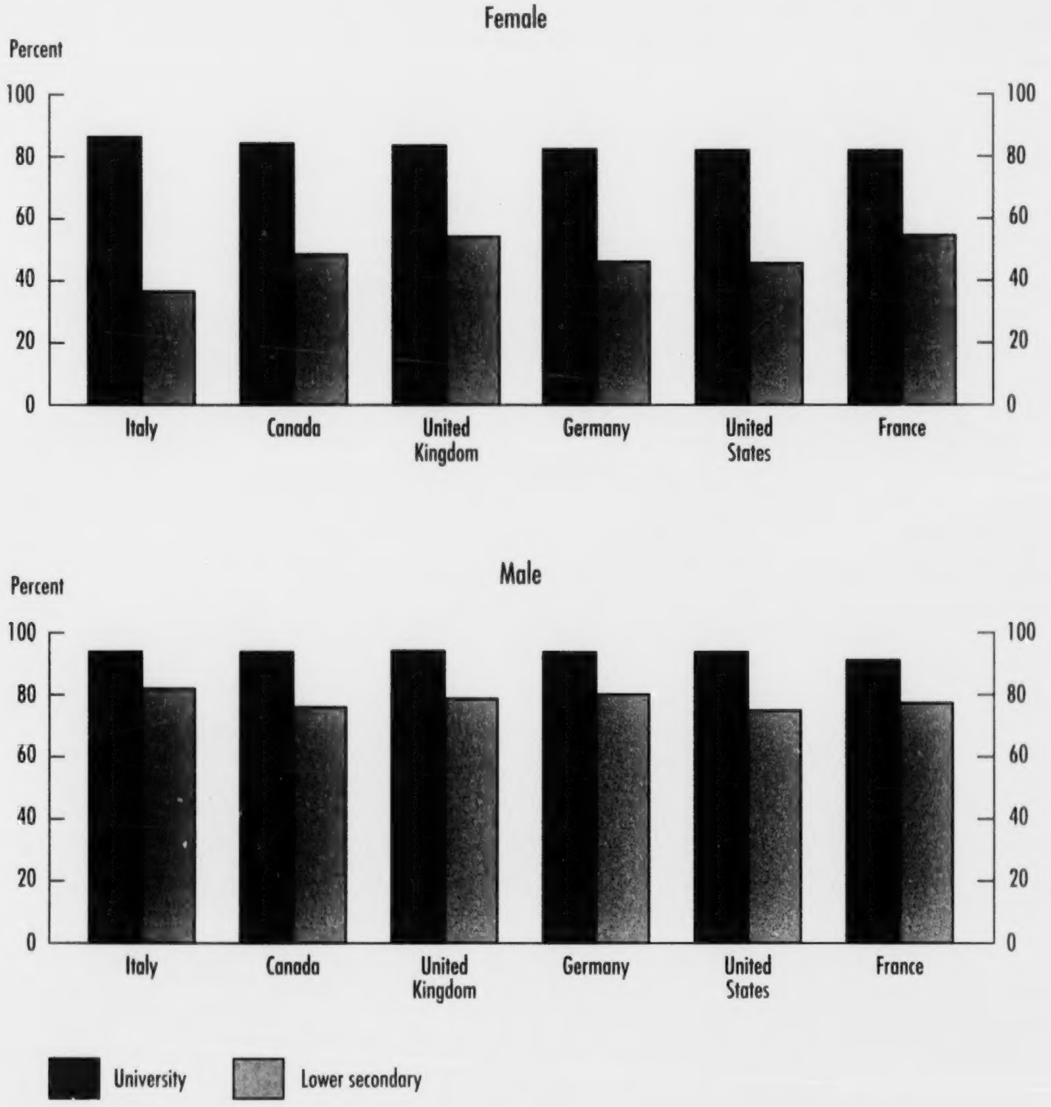


[1] No data available for Japan.

[2] Countries are sorted in descending order by total labor force participation rate of females.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 16b: Labor force participation rate of 25- to 64-year-old males and females, by highest level of education attainment and G–7 country:[1,2] 1992



[1] No data available for Japan.

[2] Countries are sorted in descending order by labor force participation rate of females having attained a university education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 17: Education and Relative Earnings

Annual earnings not only reflect the market evaluation of the economic contribution an individual makes to society, but are also a direct link to one's socioeconomic status. Education is one of the most important factors determining earnings levels. By examining the average annual earnings for males and females with various levels of education attainment, Indicator 17 informs us about the relationship between education, sex, and annual earnings levels. To provide relative comparisons, the average annual earnings of 25- to 64-year-olds with various levels of education attainment are expressed as a ratio *(multiplied by 100)* to the average annual earnings of those for whom upper secondary (roughly equivalent to high school) was the highest level of education. Thus, by definition, the ratio for those with a high school education is 100. Ratios that are below or above 100 reveal average annual earnings that do not reach or that exceed the earnings of those with a high school education. These comparisons do not take into account potential differences between males and females in the total number of years in the labor force.

- In the United States and all other countries reported, average annual earnings increased with education attainment. For instance, in 1992 the average annual earnings of U.S. 25- to 64-year-old males and females with a lower secondary education (roughly equivalent to ninth or tenth grade)* or below were 66 and 65 percent of the earnings of their counterparts with a high school education, respectively. In contrast, the average annual earnings of U.S. 25- to 64-year-old female university graduates were 170 percent of the earnings of female high school graduates; and the average annual earnings of U.S. male university graduates were 164 percent of the earnings of male high school graduates.
- In the United States, the payoff for having a university degree, compared with a high school degree, was in the middle of the range among the countries reported. Having university credentials increased average annual earnings by 64 and 70 percent for U.S. males and females, respectively, compared with the earnings of those with high school credentials. The comparable increases in all the other countries surveyed ranged from 18 percent (New Zealand) to 92 percent (Finland) for males, and 16 percent (Italy) to 106 percent (United Kingdom) for females.
- Women received larger returns than men for a university education in about half the countries reported, including the United States. In some countries, such as Sweden and Switzerland, the returns for women and men were quite similar. In France, Italy, Austria, Denmark, Finland, and Norway, men received larger returns than women for completing a university education.

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*For further explanation of education levels, see the sidebar entitled *ISCED levels of education*.

Table 17: Ratio of mean annual earnings of 25- to 64-year-olds by highest level of education attainment to mean annual earnings at the upper secondary level, by sex and country: 1992

	Female			Male		
	Lower secondary and below	Higher education (nonuniversity)	Higher education (university)	Lower secondary and below	Higher education (nonuniversity)	Higher education (university)
G–7[1]						
Canada[2]	72	116	174	81	107	162
France	81	131	142	87	127	174
Germany	84	114	175	88	116	170
Italy[2]	86	(3)	116	84	(3)	134
United Kingdom	70	156	206	80	121	171
United States	**65**	**130**	**170**	**66**	**120**	**164**
Other						
Australia[2]	90	124	175	88	121	158
Austria	81	(3)	134	85	(3)	146
Belgium	78	137	164	86	115	149
Denmark[2]	86	111	135	86	110	146
Finland[2]	94	132	176	93	132	192
Netherlands	73	(3)	147	84	(3)	132
New Zealand	73	98	154	74	85	118
Norway	76	131	157	80	131	165
Portugal[4]	67	117	188	65	124	179
Spain[2]	71	(3)	149	78	(3)	138
Sweden	92	119	156	88	118	160
Switzerland[2]	67	126	152	76	127	152

[1] No data available for Japan.

[2] 1991 data.

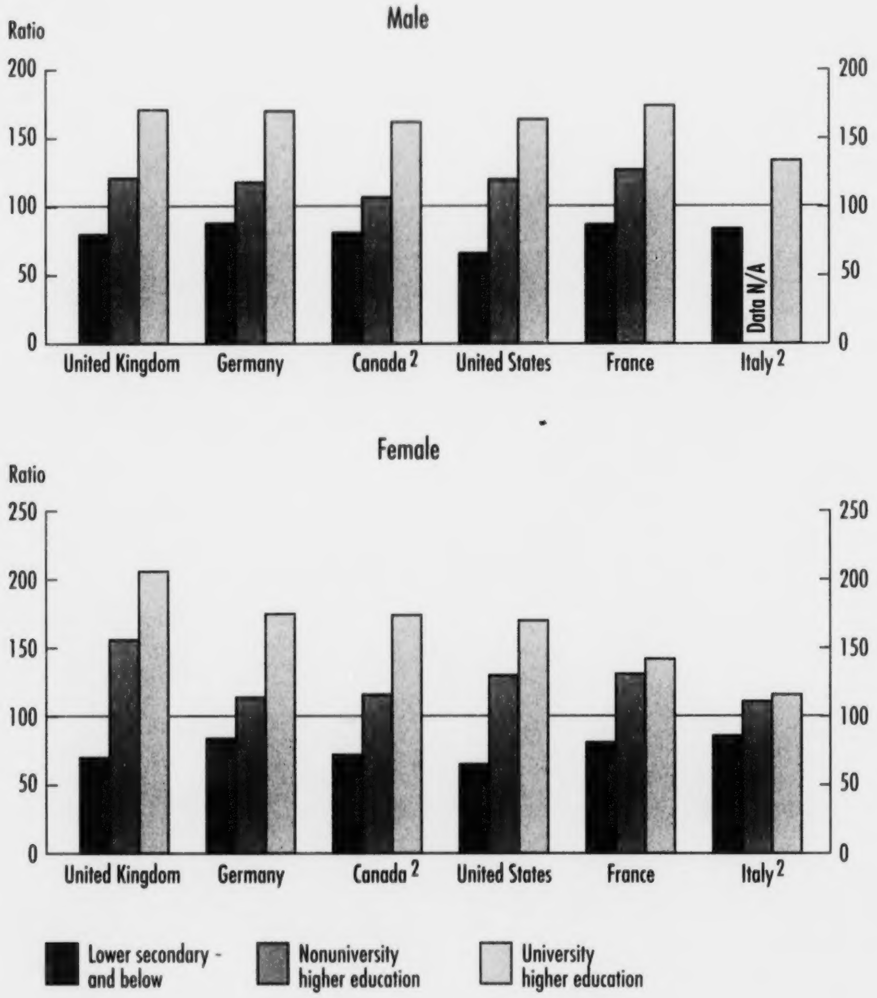
[3] Data included in another category.

[4] 1993 data.

NOTE: Table values represent the ratio multiplied by 100. See supplemental note to Indicator 17 for details on indicator calculation for Austria, Belgium, France, the Netherlands, and Switzerland.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 17: Ratio of mean annual earnings of 25- to 64-year-olds by highest level of education attainment to mean annual earnings at the upper secondary level, by sex and selected country:[1] 1992



[1] Countries are sorted in descending order by the ratio of mean annual earnings of female university graduates to females for whom high school is the highest level of education attained.

[2] 1991 data.

NOTE: A value of 100 indicates mean annual earnings equal to that of individuals for whom high school is the highest level of education attained whereas a value less than 100 reveals that mean annual earnings at a given education level are less than that of individuals for whom high school is the highest level of education attained.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 18: Gender Differences in Earnings

The ratio of mean annual earnings of females to males highlights an important aspect of equality between the sexes in the labor market. Partly due to the unequal sex distribution in industries and occupations, and partly due to the historical legacy of sex discrimination, mean annual earnings of female labor force members are usually lower than those of their male counterparts. By measuring mean annual earnings of females with various levels of education attainment as a ratio ***(multiplied by 100)*** of the mean annual earnings of their male counterparts, **Indicator 18** reveals the relationship between education and the earnings gap between males and females. By showing two age groups (25–34 and 45–64), the indicator provides information about long-term trends in earnings.

- In the United States and the other countries reported here, there was a large gap between male and female average annual earnings at all levels of education attainment and for all age groups (in various years between 1989 and 1992). For example, the average annual earnings of 25- to 64-year-old females with an upper secondary education* credential ranged from 52 percent (New Zealand) to 78 percent (Finland) of the average earnings for their male counterparts. The corresponding ratio in the United States was 60 percent.
- Education attainment made very little difference in the size of the gap between male and female earnings for 25- to 64-year-old labor force participants as a whole or for the subset aged 45–64 years. However, education attainment did make a difference for 25- to 34-year-olds. In other words, in many countries, women's earnings relative to men's were quite similar regardless of education level for those in the 45–64 age group. In contrast, there was generally an increase in the ratio of mean annual earnings of females to those of males with the level of education among 25- to 34-year-olds. For example, in the United States, the earnings of female younger adults with a lower secondary education or below were 63 percent of the earnings of men with the same education level, while the corresponding figure for those with a university education was 74 percent. This pattern is found in many other countries, including Canada, Australia, New Zealand, Spain, and Switzerland. The opposite trend is true for Germany.

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* For further explanation of education levels, see the sidebar entitled *ISCED levels of education*.

Table 18: Ratio of mean annual earnings of females to males in the labor force, by highest level of education attainment, age group, and country: various years

Country	Year	Lower secondary and below			Upper secondary education			Higher education (nonuniversity)			Higher education (university)		
G-7*		25–34	45–64	25–64	25–34	45–64	25–64	25–34	45–64	25–64	25–34	45–64	25–64
Canada	1991	59	51	53	64	55	59	68	62	64	78	61	63
France	1992	71	71	72	79	70	77	83	71	79	77	57	63
Germany	1992	84	51	58	76	55	62	63	65	60	58	64	63
United States	**1992**	**63**	**57**	**59**	**65**	**54**	**60**	**73**	**61**	**65**	**74**	**59**	**62**
Other													
Australia	1991	56	58	57	58	60	56	65	59	57	69	57	62
Denmark	1991	72	68	71	75	67	71	74	69	72	72	64	66
Finland	1990	80	79	80	80	76	78	84	79	78	84	69	72
Netherlands	1989	65	44	51	73	53	60	71	46	55	74	50	58
New Zealand	1992	43	56	51	58	42	52	64	58	60	—	51	68
Norway	1992	48	59	58	59	63	61	70	58	61	69	60	58
Portugal	1993	74	71	72	75	65	69	66	67	66	80	72	73
Spain	1991	67	57	58	73	58	64	—	—	—	84	65	69
Sweden	1992	48	72	70	59	68	68	70	69	68	69	67	66
Switzerland	1992	53	43	47	66	51	53	66	45	53	71	45	53

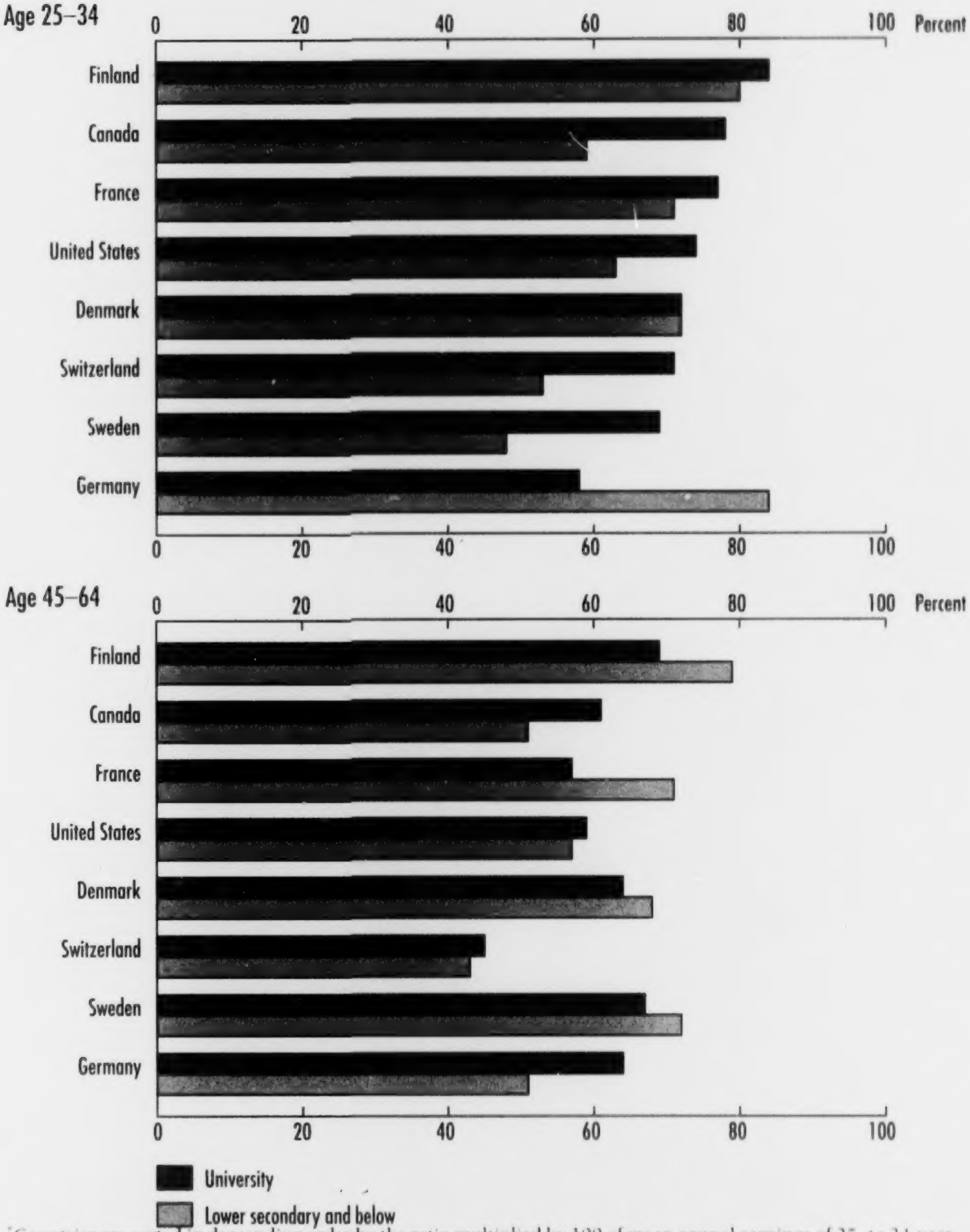
—Not available.

*No data available for Italy, Japan, and the United Kingdom.

NOTE: Table values represent the ratio multiplied by 100. See supplemental note to Indicator 18 for details on indicator calculation for France, the Netherlands, and Switzerland.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 18: Ratio of mean annual earnings of females to males, by highest level of education attainment, age group, and selected country:* various years



*Countries are sorted in descending order by the ratio multiplied by 100 of mean annual earnings of 25- to 34-year-old female university graduates to their male counterparts.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 19: Unemployment and Education

The unemployment rate (defined as the proportion of adults 25–64 years old who are without work but are seeking and currently available for work as a percentage of the total labor force) is an important indicator of the overall health of the labor market. Combatting unemployment is a key priority in the United States, as in most industrialized countries; and some researchers suggest that one means of improving job opportunities is through more formal education. With the continuing advancements in technology, less-well-educated individuals may become more and more vulnerable to failure in labor market competition. By examining the unemployment rates for persons aged 25–64 at various levels of education attainment, Indicator 19 highlights the relationship between formal education and employment.

- In 1992, unemployment rates decreased consistently as education attainment levels increased in the United States and in the majority of other countries reported. In the United States, the unemployment rate decreased almost 11 percentage points from 13.5 to 2.9 percent, for individuals who had attained a university education compared with those whose highest level of education was lower secondary (roughly 9th or 10th grade)* or below.
- In the other G–7 countries for which data were available, higher education attainment was also associated with less unemployment. In Canada, the difference between the unemployment rates for people with a lower secondary education or below and those with a university education was almost 10 percentage points, close to the difference in the United States. The corresponding differences in the United Kingdom, France, and Germany were slightly smaller (about 9, 8, and 5 percentage points, respectively) and much smaller in Italy (about 1 percentage point).

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*For further explanation of education levels, see the sidebar entitled *ISCED levels of education*.

Table 19: Unemployment rates,[1] by highest level of education attainment for persons 25–64 years of age and country: 1992

Country	Lower secondary and below	Upper secondary	Higher education (nonuniversity)	Higher education (university)
G–7[2]				
Canada	15.1	9.7	9.0	5.2
France	12.1	7.4	4.6	4.4
Germany	8.9	6.4	4.5	3.7
Italy	7.3	8.2	(3)	6.0
United Kingdom	12.3	8.3	3.3	3.6
United States	**13.5**	**7.2**	**4.6**	**2.9**
Other				
Australia	11.2	8.9	5.7	4.4
Austria	5.6	3.2	(3)	1.3
Belgium	13.0	4.7	2.3	2.2
Denmark	15.6	9.2	5.8	4.8
Finland	14.9	12.1	5.7	3.4
Ireland	19.8	9.3	5.8	3.3
Netherlands	8.0	4.7	(3)	3.9
New Zealand	11.2	7.5	4.6	3.7
Norway	7.1	4.9	2.8	1.8
Portugal	5.3	4.5	1.9	1.8
Spain	16.0	14.1	12.5	9.9
Sweden	4.6	4.3	2.3	2.0
Switzerland	3.5	2.2	2.3	3.0
Turkey	5.1	6.7	(3)	4.1

[1] This indicator defines unemployment as the proportion of adults aged 25–64 who are unemployed (i.e., persons without work and who are seeking and currently available for work) as a percentage of the total labor force. However, there are numerous ways to define unemployment. See Sorrentino, C., International comparisons of unemployment indicators, *Monthly Labor Review*, March 1993 for alternative definitions of unemployment and accompanying cross-national comparisons.

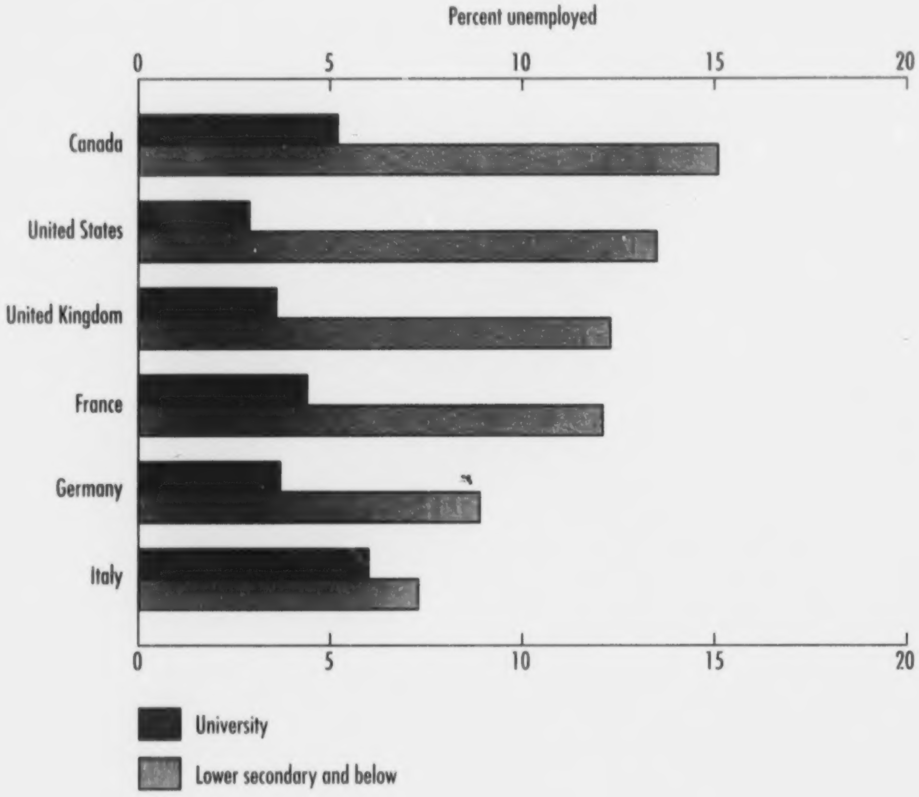
[2] No data available for Japan.

[3] Data included in another category.

NOTE: See supplemental note to Indicator 19 for details on indicator calculation for Australia, Austria, Belgium, Canada, Finland, France, Germany, Ireland, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 19: Unemployment rates for 25- to 64-year-olds, by highest level of education attainment and G–7 country:[1,2] 1992



[1] No data available for Japan.

[2] Countries are sorted in descending order according to percentage point difference in unemployment rate between highest and lowest level of education reported.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Alternative unemployment measures

Indicator 19 utilizes what is considered the conventional unemployment rate—the proportion of 25- to 64-year-olds who are without work but are seeking and currently available for work, as a percentage of the total labor force—to explore the link between unemployment and education. However, there are many different ways to compute a nation's unemployment rate, and reliance on a single indicator does not necessarily provide a complete picture of a particular nation's economy. The Bureau of Labor Statistics (BLS) has published alternative unemployment measures for the United States for over 15 years, recognizing that a single unemployment definition cannot serve all purposes for which such data are needed.

These alternative measures were used to study unemployment in 1989 in the United States, Canada, Japan, France, Germany, Italy, the Netherlands, the United Kingdom, and Sweden.[*] The alternative unemployment measures range from very narrow to very broad in scope and include:

1. *Long duration unemployment rate.* Persons unemployed 13 weeks or longer, as a percentage of the civilian labor force.
2. *Job loser rate.* The number of persons who are unemployed because they have involuntarily lost their last jobs, as a percentage of the civilian labor force. (This measure follows the standard definition of unemployed but does not include unemployed job leavers, first-time labor force entrants, or workforce re-entrants.)
3. *Adult unemployment rate.* Unemployed persons (those without work, seeking work, and currently available for work) 25 years of age and older, as a percentage of the civilian labor force 25 years of age and older.
4. *Full-time unemployment rate.* The number of unemployed persons seeking full-time employment, as a percentage of the full-time labor force (including persons working part-time for economic reasons).
5. *Conventional unemployment rate.* The total number of persons not working, who are available and seeking work, regardless of age, as a percentage of the civilian labor force. This is considered the official U.S. unemployment rate and is typically cited in comparisons.
6. *Rate encompassing persons working part-time for economic reasons.* Total full-time-job seekers, plus half of the part-time-job seekers, plus half of the total number of persons working part-time for economic reasons, as a percentage of the civilian labor force, less half of the part-time labor force.
7. *Rate from measure 6, including discouraged workers.* Discouraged workers are people who are jobless and want work, but are not looking for work because they believe they cannot find it. This rate uses the same formula as measure 6, but adds the total number of discouraged workers to both the numerator and the denominator.

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[*] C. Sorrentino. "International comparisons of unemployment indicators", *Monthly Labor Review* (March 1993).

Looking at the range of unemployment measures for a country is important for comprehending how its labor market is functioning. The rates in Sweden and Japan illustrate this point.

Sweden had the lowest unemployment rates for five of the seven measures in 1989, including the conventional unemployment rate, owing mainly to its labor market programs that assist the unemployed in actively seeking jobs or labor market training. In many cases these people became employed or enrolled in training before their duration of unemployment became too lengthy or before they became discouraged workers. However, it should be noted that Sweden's unemployment rate that includes persons working part-time for economic reasons (measure 6) was significantly larger than its conventional unemployment rate, indicating that labor slack was channeled much more into underemployment than into unemployment.

Japan also had very low unemployment rates in 1989. In fact, Japan had the lowest or second lowest unemployment rates for all of the indicators. However, Japan's unemployment rate that takes into account part-time workers and discouraged workers (measure 7) was three times that of its conventional unemployment rate and over four times that of the full-time unemployment rate.

These examples illustrate the importance of looking at multiple measures to get a complete picture of a nation's unemployment situation. This is also important when making comparisons across nations. For example, if the job loser rate was used as the measure to compare unemployment across countries, Italy would have the second lowest unemployment rate of the nine countries measured while the United States would be ranked seventh. If the conventional unemployment rate was used however, the United States would be ranked third and Italy would be ranked seventh. The unemployment rate that includes part-time workers and discouraged workers placed the United States third again, but placed Italy last. Finally, the adult unemployment rate found these two countries virtually tied for the third lowest unemployment rate.

EDUCATION INSTITUTIONS

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EDUCATION INSTITUTIONS

Countries throughout the world have addressed the issue of educating their youth by establishing education institutions. Fundamentally, these institutions are very much the same, although the details may differ. International comparisons often focus on differences that emerge between countries, although many important similarities exist. Thus, it is not surprising that U.S. schools are generally similar to those in most other countries on the indicators presented in this section.

Similarities among the G–7 countries are evident in the matrices describing various aspects of the education systems in these countries. At the most general level, there are similarities in many aspects of these countries' education systems, including ages of compulsory schooling, structure of the system by levels, and school schedules. Further, in all of the G–7 countries, formal examinations play an important role in the transition from upper secondary to higher education.

On many available indicators of school processes, the United States does not stand out from other countries and is often in the middle range of the countries reported. For example, in terms of the number of hours of instruction provided for 13-year-olds each year, the United States is in the middle of the range of countries for which data are available. The United States has more hours of instruction than the former Soviet Union, Canada, and Japan and fewer than France and the former West Germany. Of all the countries with data available, Taiwan has the highest number of hours of instruction per year, almost 200 hours more than the United States (Indicator 24). With regard to instructional practices, the United States is in the middle of the countries reported in terms of in-school use of science experimentation (Indicator 27) and calculators (Indicator 28).

Preprimary through secondary education institutions in the United States are larger (as measured by the average number of students per school) than those of many other countries, including Canada, France, and Germany. But the average school in the United States is similar in size to schools in Japan and about half the size of schools in Taiwan (Indicator 23). Additionally, classes of U.S. 13-year-olds are, on average, smaller than average classes in many other countries; however, with the exception of comparisons between the United States and Asian countries (Korea, Taiwan, and Japan) and, to a lesser degree, Spain, the differences are not significant (Indicator 21). Further, the average number of years of experience for U.S. teachers of 9- and 13-year-olds is relatively low compared with other G–7 countries for which data are available, although it is not drastically different from that of a wide range of non-G–7 countries (Indicator 22).

Although in many ways the education system in the United States is generally similar to that of other countries, in some areas it is quite different. One of the most distinctive characteristics of the education system in the United States is the decisionmaking process (Indicator 20). In the United States, the district level plays a key role in educational decisionmaking but includes the school level in the decisionmaking process by consulting with the school on many decisions. While few decisions in the United States are made autonomously at the school level, no other country relies more heavily on district level decisionmaking or includes the school level in decisions through consultation to the extent that exists in the United States.

The United States is also one of the few countries with primarily comprehensive high schools, often providing all academic programs and some vocational courses within the same school. Most other countries have differentiated schools as students get older. The United States also differs from other countries in several other specific areas, including use of computers in the schools (Indicator 29), amount of homework performed (Indicator 25), and in-class testing in mathematics and science (Indicator 26). In elementary schools, the United States and France have the lowest student/computer ratio of any country reported with the exception of Japan (Indicator 29). With regard to homework, U.S. students (9- and 13-year-olds) are more likely to spend 1 hour or less on homework than are students in most other countries reported. Finally, with few exceptions, more 13-year-old students in the United States were tested at least weekly in mathematics and in science than were their counterparts in most other countries reported.

When comparing education systems, it is important to maintain the two perspectives. Recognizing similarities across countries helps to avoid overemphasizing differences that exist. On a basic level, countries throughout the world have addressed the issue of educating young people by establishing institutions that are fundamentally very much the same. At the same time, there are also important differences between and among schools in different countries. Understanding these differences can be a source of ideas and help us understand our own system better.

Similarities among national education systems

International indicators of education are intended to highlight comparisons across nations, often by emphasizing relative differences among nations. Consequently, what is sometimes unintentionally obscured in a collection of indicators is the degree to which national education systems are in a broad sense alike. Measures of how much and to what extent national school systems have converged in function and structure worldwide and speculations as to why some aspects of these systems are becoming more similar offer a broader context from which to consider national differences across specific indicators.

In the early 1960s, three marked trends in schooling worldwide emerged, which have continued to the present. These trends, listed below, are described in the following paragraphs:

- There has been a persistent increase in the proportion of children attending formal schooling in almost all countries, and there has been a corresponding increase in the length of the average school career worldwide.
- The organization of formal schooling—both structure and content—has become more similar across nations.
- The supply of formal education and educational outcomes have become primary concerns of most national governments.

Understanding the nature of these trends and why they are happening provides some insight into this international transformation of formal schooling.

In some countries, such as the United States, the proportion of children aged 6–16 attending school (enrollment rates) had reached a relatively high level by as early as the mid-19th century, while in most other countries formal schooling was reserved for smaller proportions of the population. But immediately following World War II there began what some call a "world educational revolution" during which almost all countries, regardless of their economic and social condition, expanded the proportion of children attending school at both the primary and secondary levels.[1] From 1950 to 1970, the primary school enrollment rates of wealthier, developed countries approached 100 percent, and secondary school rates increased from one-third to one-half of the relevant age cohort. Less wealthy, developing nations lagged behind developed countries in enrollment rates, but they also ventured onto the course of increasing enrollment. This trend has continued to the present with near universal secondary school enrollment rates in most developed countries and with high primary school enrollment rates (60 to 80 percent) in most developing countries as well as corresponding growth in secondary school rates.[2] Although there still is variation in the level of enrollment among nations, worldwide enrollment rates have neither dropped nor remained constant.

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[1] J. Meyer, F. Ramirez, R. Rubinson, and J. Boli-Bennett, "The World Educational Revolution, 1950–70" in *National Development and the World System, Educational, Economic and Political Change, 1950–70*, ed. J. Meyer and M. Hannan (Chicago: University of Chicago Press, 1979).

[2] D. Baker, *The Size and Structure of Secondary Education in Developing Countries*, published report of the Population and Human Resources Department, The Education and Employment Division, The World Bank (Washington D.C.: 1993).

This near universal demand for schooling has been met with increasingly similar organizational forms for education. For example, an assessment of national school systems reveals increased convergence on similar policies and practices over a range of organizational and administrative dimensions, such as the provision and duration of compulsory schooling, the structure of school grades (or forms) with regard to age, formal testing, administrative procedures, evaluation of instruction, coeducation, public financing, and centralization of financing.[3] Although not all national systems are exactly alike, there is a strong historical trend toward similar systems of education.

This tendency is also evident in the curricular content of schooling. A study of the content of elementary school curricula worldwide finds convergence toward a standard set of subjects across national school systems starting as early as 1920. Over the next 70 years, this core elementary school curriculum has taken up an increasingly large share of instruction time in most national school systems.[4] Curricular convergence has been observed at higher levels of education as well. An example is the persistent worldwide decrease in vocational training and corresponding increase in academic training in the middle/junior high and high school curriculum.[5]

The main driving force behind educational enrollment and organizational convergence is the increased control over schooling by the nation-state over the past 50 years. Education has become a concern at a national level rather than only at a local level. The second half of this century witnessed the end of colonial empires and the rise of the nation-state (country) as the basic political unit worldwide, bringing the responsibility for financing, supplying, and regulating formal schooling to the level of the nation-state. Both new and existing nations are turning increasingly to formal education for a number of political and economic purposes, such as the construction of a common citizenry, the training of a competitive labor force, and the reduction of social problems.[6]

Formal schooling has become a "world institution." Most of the world's children will attend a school that is markedly similar in organization and curricular content to schools elsewhere in the world. Although there are interesting differences among national systems, the common logic behind designing modern schools has resulted in increasing convergence toward similar structures.

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[3] A. Inkeles and L. Sirowy, "Convergent and Divergent Trends in National Educational Systems," *Social Forces* 62(2) (1993): 303–332.

[4] A. Benavot, Y. Cha, D. Kamens, J. Meyer, and S. Wong, "Knowledge for the Masses: World Models and National Curricula, 1920–1986," *American Sociological Review* 56(1991): 85–100.

[5] A. Benavot, The Rise and Decline of Vocational Education. *Sociology of Education* 56(2) (1983): 63–76.

[6] J. Meyer, F. Ramirez, R. Rubinson, and J. Boli-Bennett, "The World Educational Revolution, 1950–70" in *National Development and the World System, Educational, Economic and Political Change, 1950–70*, ed. J. Meyer and M. Hannan (Chicago: University of Chicago Press, 1979).

Indicator 20: Locus and Mode of Decisionmaking in Education

Recent restructuring reforms in the United States have focused attention on educational decisionmaking at the level of the school. This indicator provides information about the percentage of decisions that are made at the school level as well as at intermediate and central levels. Based on a discrete list of decisions in four areas—educational planning and structures, personnel management, organization of instruction, and resources—the indicator reports the percentage of decisions that are made at each of four levels of governance: the school, intermediate 1 (the level closest to the school), intermediate 2 (often the regional level), and the country. In the United States, these correspond to the school, district, state, and federal levels. The indicator also provides additional information on the role of the school level in decisionmaking. It distinguishes between decisions that are made autonomously at the school level, those made at the school level after consulting another level, those made at the school level within a framework set by another level, and those for which the school is consulted by another level.

- In contrast to all other reported countries, in the United States less than 5 percent of all decisions were made at the country level or at the intermediate level closest to the country (the state level) in 1991. It should be noted that these levels may still have influenced decisionmaking through setting legal or regulatory frameworks that constrain the decisions of others or through being consulted by others.
- In the United States, decisionmaking was concentrated at the district level (71 percent). The only other instances of such a high concentration of decisionmaking at one level occurred in Ireland and New Zealand, where a similar percentage of decisions were made at the school level.
- Schools in the United States were consulted by another level in decisionmaking substantially more than schools in any other country. Without this involvement, U.S. schools were among those with the smallest decisionmaking role. When all types of involvement are considered, schools in the United States are involved in a comparable percentage of decisions relative to other countries. Schools in Ireland and New Zealand have the largest decisionmaking roles, as over 70 percent of decisions are made at the school level; 24 and 38 percent of the school-level decisions made in Ireland and New Zealand, respectively, are made autonomously.

Table 20a: Decisions made by level of governance as a percentage of all decisions (public lower secondary education),[1] by country: 1991

	Locus of decisionmaking				
Country	**School**	**Intermediate 1**	**Intermediate 2**	**Country**	**Total**
G–7[2]					
France	35	0	35	30	100
Germany	32	44	17	7	100
United States	**26**	**71**	**3**	**0**	**100**
Other					
Austria	44	8	26	23	100
Belgium	26	50	24	0	100
Denmark	39	48	0	14	100
Finland	38	50	0	13	100
Ireland	74	8	0	18	100
New Zealand	73	0	0	27	100
Norway	31	45	0	24	100
Portugal	42	0	3	55	100
Spain	28	26	14	32	100
Sweden	47	47	0	6	100
Switzerland	9	44	46	0	100

[1] This table reflects the decisions for which the specified decisionmaking level has the final decisionmaking authority. In the United States, for instance, many decisions are made within a framework set by another level. In these instances, the decisionmaker is the level that has final decisionmaking authority, not the level that set the framework.

[2] No data available for Canada, Japan, Italy, and the United Kingdom.

NOTE: Decisions made at the school level are those made by the institution and/or school. Intermediate 1 refers to decisions made closest to the school level, Intermediate 2 refers to decisions made mainly at the regional level, and the country level refers to decisions made by the central government.

See supplemental note for Indicator 20 for details on data collection procedures, decisionmaking modes, and decision areas and for details concerning indicator calculation for Austria, Belgium, France, Germany, Ireland, Spain, and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Table 20b: Decisions involving the school level as a percentage of all decisions, by mode of decisionmaking and country: 1991

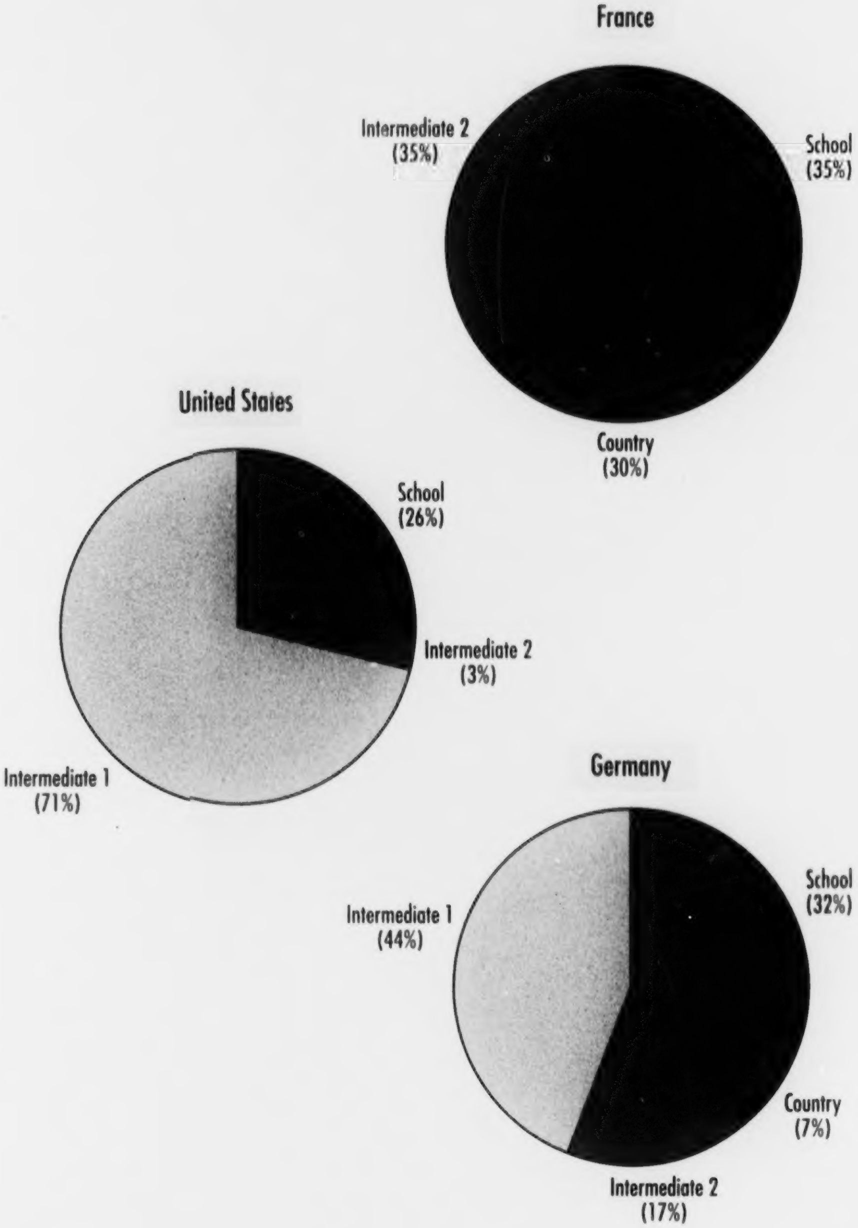
	Decisions made by school level				Decisions influenced by school level through consultation with another level
	Autonomously	After consultation with another level	Within a framework set by another level	Total	
G–7[*]					
France	13	0	22	35	10
Germany	3	4	25	32	7
United States	**5**	**2**	**19**	**26**	**23**
Other					
Austria	19	4	21	44	0
Belgium	19	3	3	26	5
Denmark	19	9	12	39	9
Finland	19	0	19	38	9
Ireland	24	20	30	74	5
New Zealand	38	3	32	73	3
Norway	14	0	17	31	8
Portugal	9	2	31	42	2
Spain	10	3	15	28	4
Sweden	15	0	32	47	4
Switzerland	0	0	9	9	10

[*] No data available for Canada, Japan, Italy, and the United Kingdom.

NOTE: See supplemental note to Indicator 20 for details on data collection procedures, decisionmaking modes, and decision areas.

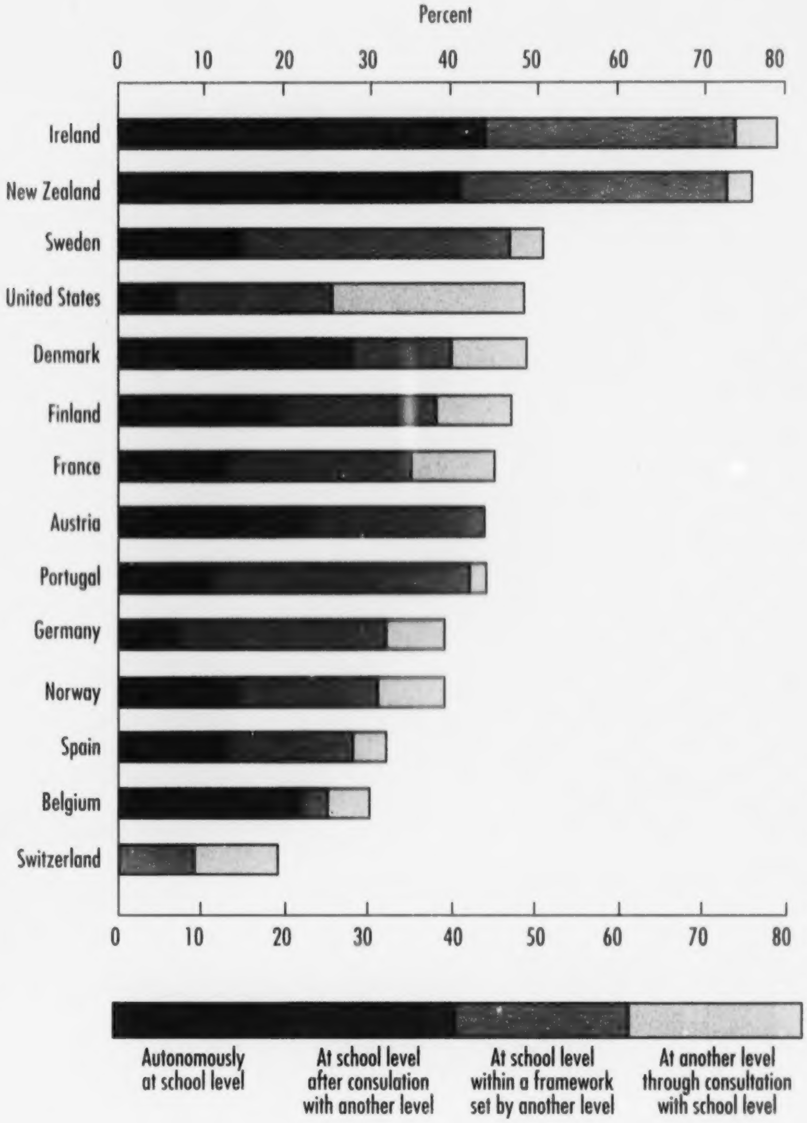
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Figure 20a: Decisions made by level of governance as a percentage of all decisions (public lower secondary) in France, Germany, and the United States: 1991



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Figure 20b: Decisions involving the school level as a percentage of all decisions, by mode and country:* 1991



*Countries are sorted in descending order by the percentage of decisions involving the school level.

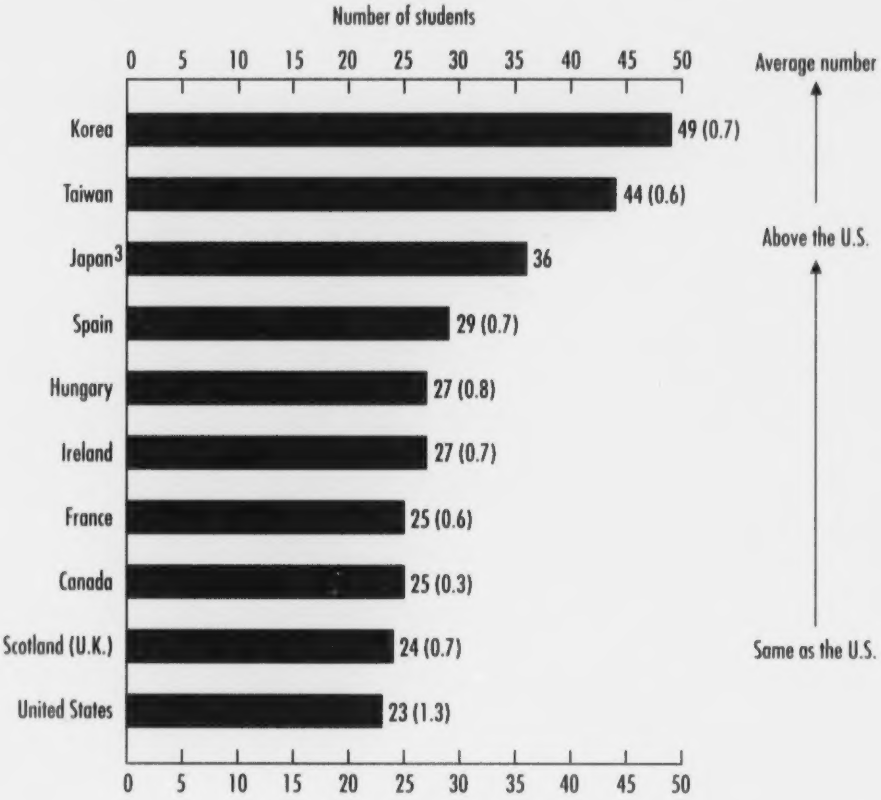
SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993.

Indicator 21: Class Size

The number of students a teacher faces during a period of instruction—typically referred to as class size—is a measure of pupil load. Average class size provides valuable information on students' learning environment. In the United States, small class sizes are valued because they increase opportunities for students to receive personalized attention from their teachers and reduce the burden on teachers often associated with managing large numbers of students. However, maintaining small class sizes is often more expensive than creating larger classes. Furthermore, large classes do not necessarily hinder instruction. The impact of class size on the overall learning environment is related to such factors as teaching style, student behavior, and the opportunity for students to meet with teachers outside of class. Because the indicator measures *average* class size, it does not reflect whether schools choose to have different-sized classes for different subjects or for different types of students. See Indicator 39 for details on a related topic, student/teacher ratio.

- In 1991, average class sizes for 13-year-old students were between 23 and 29 in all but three countries—Korea, Taiwan, and Japan. In these countries, class sizes were relatively large, 49, 44, and 36, respectively. The United States had an average class size of 23 students per class.

Figure 21: Average class size for 13-year-olds,[1,2] by country: 1991



[1] Data refer to the modal grade of 13-year-olds in each country.

[2] Standard errors are presented in parentheses.

[3] 1985 data for lower-secondary-level education.

NOTE: See supplemental note to Indicator 21 for details on indicator calculation for Canada, Scotland, Spain, and the United States.

SOURCE: Educational Testing Service, The International Assessment of Educational Progress, *Learning Mathematics* (1992). For Japan, U.S. Department of Education, *Japanese Education Today* (Washington, D.C.: 1987) (data provided by Japanese Ministry of Education, Science, and Culture).

Class size in the United States and Japan

In the United States, class size is an important issue for policymakers and education practitioners, some of whom argue that small class size will facilitate student achievement. Its importance can also be attributed to the desire for more individualized student attention and a reduced workload for teachers.[1] While class size has important policy implications, other important policy questions include what type of learning and instructional activities can take place in classrooms of differing sizes.

The average class sizes of all of the countries reported in figure 21 are similar to or larger than those of the United States. These numbers are a reflection of the social, cultural, and organizational factors that exist in the different countries. Class size in Japan is a case in point.

In the United States individualism is prized, while in Japan group orientation is emphasized.[2] To foster individualism, teachers in U.S. classrooms focus on individual student needs and abilities and may develop varied lesson plans to serve students with different abilities; with a larger class size, it would therefore mean more work for the teacher to do that.

In Japan, classrooms have a distinct group orientation which is supported by the use of a uniform curriculum and instructional methods that minimize the need for individual curricular requirements.[3] The whole group receives the same lesson and is expected to master it. In Japan, therefore, a larger class size does not necessarily create more lesson planning work for the teacher.[4]

Teachers in Japan employ several strategies to ensure that larger class sizes do not translate into more discipline problems or time spent on transitions between activities in their classrooms.[5] Beginning the first day of elementary school, teachers introduce techniques and skills that will allow their students to function effectively in a group. Students learn and practice repeatedly how to move from one activity to another, how to organize their desks for study, and how to come to order. Each classroom also has a rotating student class leader who cues the students to perform the various routines. As a result, responsibility for classroom discipline and management is not solely the teacher's burden. Rather, it is shared by the class, as students view themselves as responsible for their own behavior.

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[1] U.S. Department of Education, *Class Size and Public Policy: Politics and Panaceas* (Washington, D.C.: 1988).

[2] H.W. Stevenson and J.W. Stigler, *The Learning Gap* (New York: Summit Books, 1992).

[3] U.S. Department of Education, *Class Size and Public Policy: Politics and Panaceas*, op. cit.

[4] U.S. Department of Education, *Japanese Education Today* (Washington, D.C.: 1987).

[5] U.S. Department of Education, *Class Size and Public Policy: Politics and Panaceas*, op. cit.

Indicator 22: Teaching Experience

On-the-job experience provides teachers with practical opportunities in which to build their expertise in teaching and classroom management. Further, average years of teaching experience are an indication of teachers' maturity and their long-term commitment to education. All of these factors can play a role in the provision of high-quality instruction.

- During the 1991–92 school year, U.S. teachers of 9- and 13-year-olds had an average of 15 and 14 years of teaching experience, respectively. They had fewer average years of teaching experience than their counterparts in most of the countries reported. To illustrate, teachers of 9-year-olds in five countries—including the three other G–7 countries reported—had an average of at least 20 years of teaching experience; and for teachers of 14-year-olds, the values were 17, 19, and 19 for these three G–7 countries.

Table 22: Average years of teaching experience for teachers of 9- and 14-year-olds,[1] by country: school year 1991–92

Country	Age 9	Age 14
G–7[2]		
France	21 (0.75)	19 (0.72)
Italy	22 (0.74)	19 (0.54)
West Germany (former)	20 (0.68)	17 (0.54)
United States	**15 (0.52)**	**14 (0.66)**
Other		
Belgium	18 (0.69)	20 (0.74)
Botswana	— —	11 (0.49)
Cyprus	17 (0.70)	18 (0.47)
Denmark	18 (0.52)	18 (0.55)
Finland	15 (1.35)	15 (1.13)
Greece	13 (0.73)	12 (0.53)
Hong Kong	16 (0.86)	10 (0.74)
Hungary	17 (0.90)	17 (0.84)
Iceland	12 (0.53)	15 (0.67)
Indonesia	12 (0.58)	— —
Ireland	19 (0.99)	17 (0.71)
Netherlands	17 (0.70)	17 (0.65)
New Zealand	14 (0.73)	13 (0.77)
Norway	16 (0.62)	18 (0.74)
Philippines	— —	11 (0.53)
Portugal	23 (0.76)	9 (0.57)
Singapore	19 (0.79)	14 (0.91)
Slovenia	19 (0.80)	16 (0.68)
Spain	18 (0.50)	18 (0.50)
Sweden	21 (0.60)	17 (0.78)
Switzerland	14 (0.67)	18 (0.55)
Thailand	— —	14 (0.56)
Trinidad and Tobago	17 (0.62)	15 (0.69)
Venezuela	12 (0.63)	12 (0.63)
Zimbabwe	— —	6 (0.58)

—Not available.

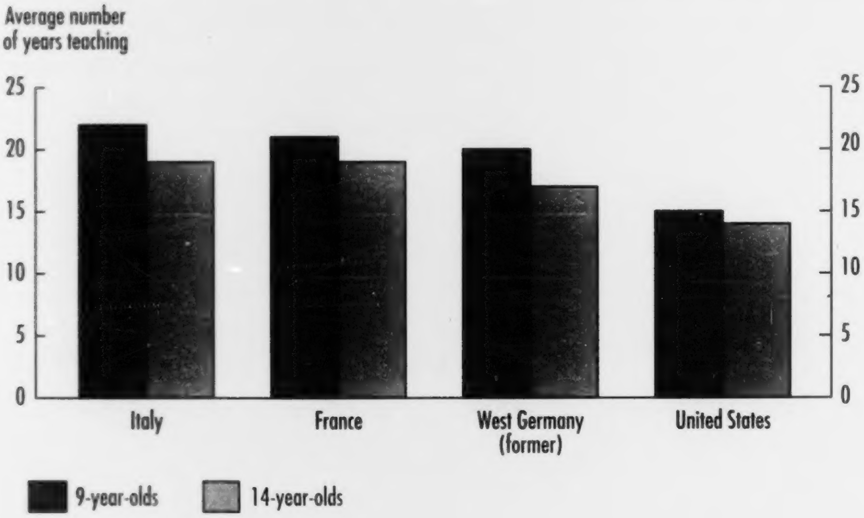
[1] Standard errors are in parentheses.

[2] No data available for Canada, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 22 for details on indicator calculation for Belgium, Denmark, Finland, France, Hong Kong, Hungary, Iceland, Indonesia, Ireland, Italy, Singapore, Spain, and Venezuela.

SOURCE: The International Association for the Evaluation of Educational Achievement, IEA Reading Literacy Study, unpublished tabulations, 1992.

Figure 22: Average years of teaching experience for teachers of 9- and 14-year-olds, by G–7 country:[1,2] school year 1991–92



[1] No data available for Canada, Japan, and the United Kingdom.

[2] Countries are sorted in descending order by the average years of teaching experience.

SOURCE: The International Association for the Evaluation of Educational Achievement, IEA Reading Literacy Study, unpublished tabulations, 1992.

Indicator 23: Number of Schools and School Size

This indicator measures the number of public and private schools, the number of students, and the average number of students per school at the preprimary through secondary and higher education levels. In most education systems, schooling is divided by level (e.g., preprimary, primary, lower secondary, upper secondary, and so on) or by curricular program (e.g., academic, vocational). These levels and programs may be separated by school, or they may be combined. If they are kept separate, the number of individual schools is likely to be large, and the average school size is likely to be small. Some educators believe there is a negative association between large school size and student achievement and therefore encourage a reduction in the number of students per school. On the other hand, though smaller schools may have a stronger sense of community, larger schools often can provide broader curricular offerings.

- Of the G–7 countries for which data are available for various years between 1989 and 1992, the United States and Japan had the largest average number of students per school at the preprimary through secondary level (398 and 395, respectively). The average for France (166), the G–7 country with the smallest number of students per school, was less than half that of the United States and Japan.
- The average number of students per preprimary through secondary school in Taiwan (873), the country with the largest number of students per school, was over five times higher than that of Finland (156), the country with the smallest average school size at the preprimary through secondary level.
- Of the G–7 countries included in various years between 1988 and 1993, the United States had a greater average number of students per school at the higher education level (3,988) than Japan (2,188) and Canada (3,769). Germany, Korea, and Taiwan were the only 3 countries among the 11 for which data were available with averages above 5,000. Korea's average (5,677) was almost 8 times that of Belgium (728), the country with the smallest number of students per school.

Table 23a: Number of public and private schools, number of students, and average number of students per school in preprimary through secondary institutions, by level and country: various years

Country	Year	Number of preprimary–primary schools	Number of secondary schools	Number of schools with preprimary–secondary combined	Total number of preprimary–secondary schools	Number of preprimary–secondary students (in thousands)	Average number of students per school
G–7[1]							
Canada	1989	—	—	—	14,300	5,020	351
France	1991–92	62,119	11,306	—	73,425	12,219	166
Germany	1991	19,877	16,172	580	36,629	10,119	276
Japan	1989	39,903	16,781	—	56,684	22,376	395
United Kingdom	1991–92	25,338	4,731	2,488	32,557	9,049	278
United States	**1991–92**	**78,078**	**26,510**	**3,269**	**107,857**	**42,964**	**398**
Other							
Australia	1992	7,086	1,617	1,254	9,957	3,099	311
Belgium[2]	1990–91	1,878	692	—	2,570	799	311
Finland	1993	—	820	4,610	5,430	849	156
Korea	1990	14,689	4,198	—	18,887	9,867	522
New Zealand	1990	2,917	253	146	3,316	692	209
Spain	1990–91	20,517	5,370	—	25,887	8,369	323
Taiwan	1991–92	4,432	975	—	5,396	4,711	873

—Not available.

[1] No data available for Italy.

[2] French community only.

NOTE: Private school data included in U.S. figures for number of schools by level are adjusted using national percentages of public school distribution by level. See supplemental note to Indicator 23 for further details.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, tables 44 and 95; *Digest of Education Statistics, 1994*, table 63. Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1993. United Nations Educational, Scientific, and Cultural Organization, *Statistical Yearbook*, 1992. Various country sources—see supplemental note to Indicator 23 for a listing.

Table 23b: Number of public and private higher education institutions, number of students enrolled, and average number of students per institution, by level and country: various years

Country	Year	Number of nonuniversity institutions	Number of universities	Total number of higher education institutions	Number of students enrolled in higher education (in thousands)	Average number of students per institution of higher education
G-7[1]						
Canada	1987	102	127	229	863	3,769
France	1990–91	407	77	484	1,276	2,636
Germany	1991	217	98	315	1,783	5,660
Japan	1988	63	490	1,123	2,613	2,327
United States	**1991–92**	**1,444**	**2,157**	**3,601**	**14,360**	**3,988**
Other						
Belgium[2]	1990–91	142	9	151	110	728
Finland	1993	175	21	196	188	959
Korea	1990	151	107	258	1,491	5,779
New Zealand	1990	31	7	38	142	3,737
Spain	1989–90	—	—	743	1,093	1,471
Taiwan	1991–92	75	46	121	612	5,058

—Not available.

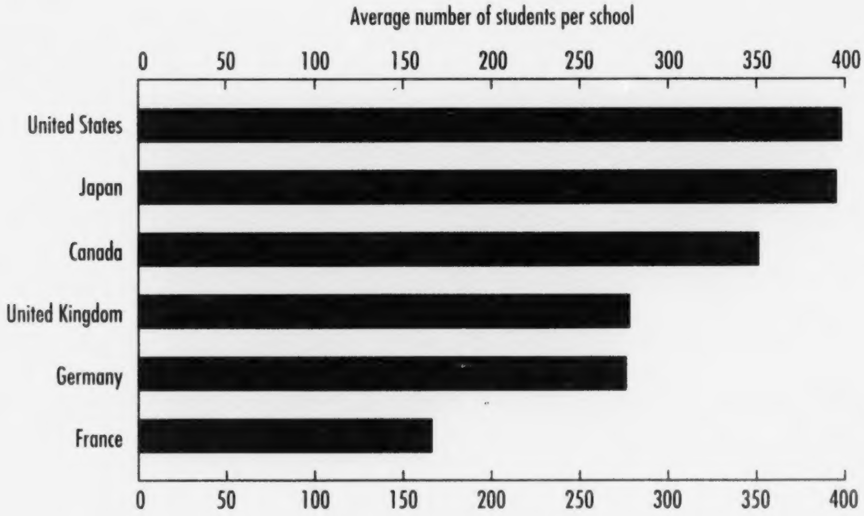
[1] No data available for Italy or the United Kingdom.

[2] French community only.

NOTE: See Glossary for definitions of university and nonuniversity institutions.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1992*, table 227; *Digest of Education Statistics, 1993*, table 192. Various country sources—see supplemental note to Indicator 23 for a listing.

Figure 23a: Average number of students enrolled per preprimary–secondary education institution, by G–7 country:[*] various years

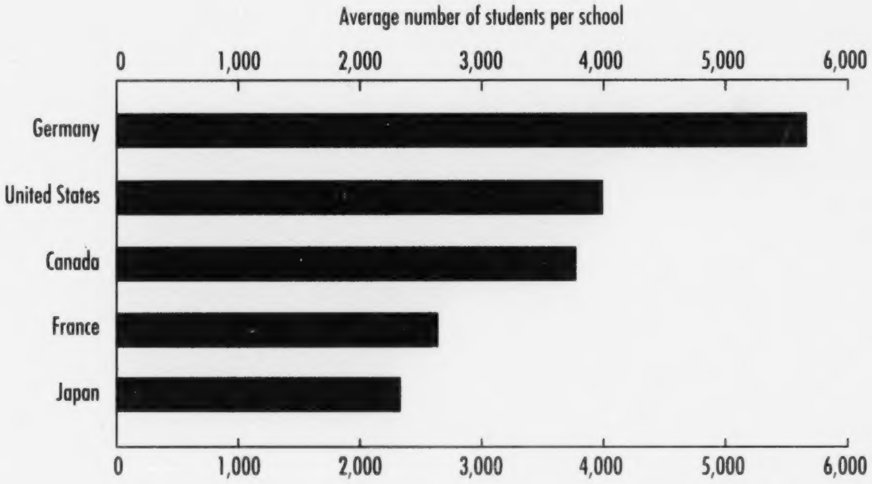


[*] No data available for Italy.

NOTE: See supplemental note to Indicator 23 for country-level sources.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993*, tables 44 and 95; *Digest of Education Statistics, 1994*, table 62. United Nations Educational, Scientific, and Cultural Organization, *Statistical Yearbook*, 1992. Various country sources—see supplemental note to Indicator 23 for a listing.

Figure 23b: Average number of students enrolled per institution of higher education, by G–7 country:[*] various years



[*] No data available for Italy and the United Kingdom.

NOTE: See supplemental note to Indicator 23 for country-level sources.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1992*, table 227; *Digest of Education Statistics, 1993*, table 192. Various country sources—see supplemental note to Indicator 23 for a listing.

Indicator 24: Time in Formal Instruction

Time spent on instruction is a major influence on student achievement, but equally if not more important is how that time is spent, an influence not measured here. Time spent on mathematics and science instruction is an indicator of a student's access to learning opportunities in these subject areas. Within countries, differences in the time spent on mathematics and science instruction provides an indication of the priority given those subjects in relation to each other.

- Compared with other countries, schools in the United States provided a relatively low number of instructional days during the 1990–91 school year (178), but had a relatively high number of hours of instruction per day (5.6). In the United States, the average number of hours of instruction per year (997) was either similar to or higher than the average in all but two of the countries reported, France and Taiwan.
- Japan provided relatively few hours of instruction per day (4.0), but had a long school year (220 days). Taiwan had both a relatively long school day and school year and, at 1,177 hours, had the highest number of average hours of instruction per year of all of the countries reported.
- The United States devoted a relatively large number of hours to both mathematics and science instruction each week (3.8 and 3.7 hours, respectively). These values were among the highest of the countries reported.
- In most of the countries for which data were available, 13-year-olds received more hours of mathematics instruction per week than science instruction. Students typically received between 3 and 4 hours of mathematics instruction each week, but, in half of the countries reporting data, they received 3 hours or less of science instruction.

Table 24: Time in formal instruction for 13-year-olds,[1,2] by country: 1991

	Overall Instruction			Mathematics	Science
Country	Average hours per day	Average days per year	Average hours per year	Average hours per week	Average hours per week
G–7[3]					
Canada	5.1 (0.01)	188 (0.2)	959 (—)	3.8 (0.03)	2.6 (0.03)
France	6.2 (0.06)	174 (1.7)	1,079 (—)	3.8 (0.03)	2.9 (0.14)
West Germany (former)[4]	4.6 (—)	219[5] (—)	1,007 (—)	— —	— —
Japan	4.0 (—)	220 (—)	875 (—)	— —	— —
United States	**5.6(0.08)**	**178 (0.4)**	**997 (—)**	**3.8 (0.09)**	**3.7(0.13)**
Other					
Hungary	3.7 (0.02)	177 (1.5)	655 (—)	3.1 (0.04)	3.5 (X)
Ireland	5.4 (0.07)	173 (0.9)	934 (—)	3.2 (0.04)	2.7 (0.07)
Israel	4.6 (0.11)	215 (2.2)	989 (—)	3.4 (0.06)	3.0 (X)
Korea	4.4 (0.04)	222 (0.4)	977 (—)	3.0 (0.03)	2.4 (0.05)
Soviet Union (former)	4.1 (0.04)	198 (2.1)	812 (—)	4.3 (0.03)	6.5 (0.01)
Taiwan	5.3 (0.12)	222 (2.5)	1,177 (—)	3.4 (0.04)	4.1 (X)

—Not available.

X Jackknifed standard error is greater than .165. In Educational Testing Service, International Assessment of Educational Progress *Learning Science*, 1992, data and the accompanying standard errors were reported in minutes. For Hungary, Israel, and Taiwan, these standard errors were reported as "greater than 9.9." When the values were transformed into hours, standard errors for these three countries became "greater than .165" (9.9 minutes is equivalent to .165 hours).

[1] The average hours of instruction per day includes only the time students spend exposed to educational instruction and does not include time spent in lunch, extracurricular activities, homeroom, breaks between classes, and other noninstructional activities. Thus the actual length of the school day may be considerably longer.

[2] Jackknifed standard errors are in parentheses.

[3] No data available for Italy and the United Kingdom.

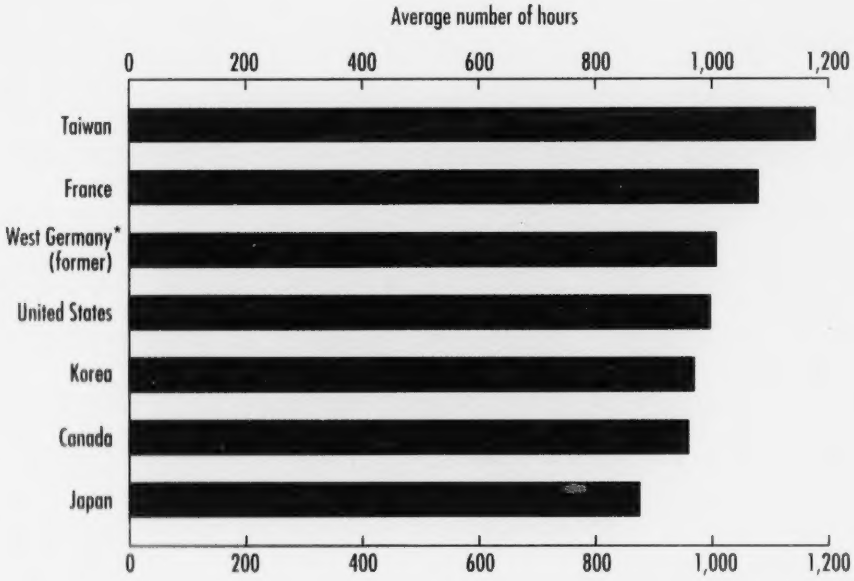
[4] Reflects 1990–91 school year.

[5] Includes both full- and half-days.

NOTE: See supplemental note to indicator 24 for information on indicator calculation for Canada, the former West Germany, Israel, Japan, the former Soviet Union, and the United States.

SOURCE: All countries from Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992; *Learning Science*, 1992; except the former West Germany: unpublished tabulations, International Association for the Evaluation of Educational Achievement (IEA) Study of Reading Literacy, 1992; and Japan: National Institute of Educational Research, Ministry of Education, Science, and Culture, Government of Japan, *Monbusho*, 1992.

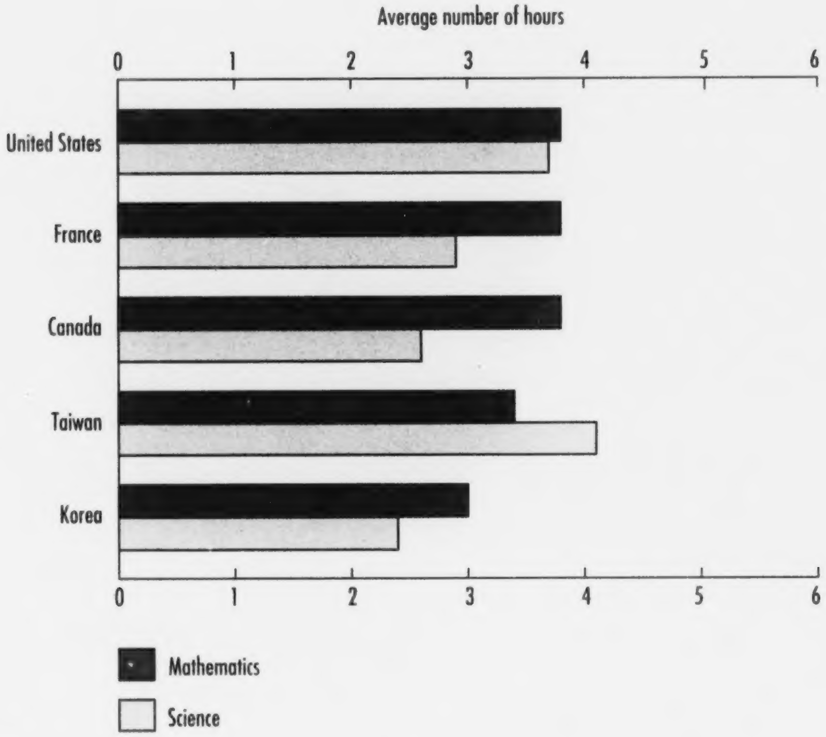
Figure 24a: Average hours of formal instruction per year for 13-year-olds, by selected country: 1991



*1990–91 school year.

SOURCE: All countries from Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992; *Learning Science*, 1992; except the former West Germany: unpublished tabulations, International Association for the Evaluation of Educational Achievement (IEA) Study of Reading Literacy, 1992; and Japan: National Institute of Education Research, Ministry of Education, Science, and Culture, Government of Japan, *Monbusho*, 1992.

Figure 24b: Average hours of instruction per week in mathematics and science for 13-year-olds, by selected country:* 1991



*Countries are sorted in descending order by average number of hours of mathematics instruction each week.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992; *Learning Science*, 1992.

Organized instruction outside of formal schooling

For many students, classroom instruction is only one part of the total learning experience. It does not reflect the amount of time students spend in formal and informal organized learning situations outside of school, such as after-school programs, supplementary instruction at other schools in the evenings and on weekends, and private tutoring sessions.

Educational settings outside of school exist in the United States. However, these learning opportunities are often informal, and more organized learning activities are not uniformly available across communities. In other countries, organized education outside of formal schooling is more extensive. Perhaps the most widely known case is that of Japan, where large numbers of students of all ages throughout the country attend *juku* after school and on weekends. *Juku* are typically private schools offering instruction to help students get ahead in their schoolwork and prepare for the large number of entrance examinations that help determine students' chances to enter particular high schools or colleges and universities.[1]

Junior high school students have the highest rates of *juku* attendance, primarily because all students must take a rigorous entrance examination to enter high school (among high school students, only those wishing to enter college face similar examination pressures). One study estimates that between 60 and 70 percent of all students in the seventh, eighth, and ninth grades (the junior high school years in Japan), attend private classes after school at least two or three times a week for two hours a session.[2] Rates of attendance among elementary school students are also high, particularly in urban areas.

The type of instruction received in *juku* ranges from basic drill-and-practice sessions, which are intended to reinforce information learned in school or prepare students for examinations, to creative and innovative instruction not available in the typical school. The most commonly studied subject at *juku* is mathematics, although English is also very popular.[3] Public opinion in Japan is divided on whether the extra time and money spent on *juku* is worthwhile, but the feeling among parents and students remains strong that attending the schools will provide an added academic advantage, or, more typically, that not attending the schools will result in students falling behind their peers.

Regardless of the merits of *juku*, attendance at them can add significantly to the total time spent in a structured learning environment in a way not normally accounted for by most measures of learning time.

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[1] B. Duke. *The Japanese School, Lessons for Industrial America* (New York: Praeger Publishers, 1986); B. Feiler. *Learning to Bow: An American Teacher in a Japanese School* (New York: Ticknor and Fields, 1991); T. Rohlen, *Japan's High Schools* (Berkeley: University of California Press, 1983).

[2] Duke, *The Japanese School, Lessons for Industrial America*, op. cit.

[3] Duke, *The Japanese School, Lessons for Industrial America*, op. cit.

Indicator 25: Time Spent on Homework

Since homework is a form of practice, most educators postulate that it improves student achievement, and, in fact, most of the empirical studies conducted on the subject suggest that the amount of time spent on homework is positively related to student achievement. However, this relationship is influenced by such factors as differences in students' grade level. Although statistics concerning the average number of hours spent on homework provide one indication of the role of homework, they do not address the quality of the homework assigned, the degrees to which students actually complete homework, or the effort and care students take in completing it.

- Overall, it appears that in 1991, 9- and 13-year-olds in the United States were more likely to spend 1 hour or less on homework each day than their counterparts in many of the other countries studied. About 20 percent of 9-year-old students and 10 percent of 13-year-old students in the United States did no homework at all each day. The corresponding percentages were much lower in all the other countries reported, except in Canada and Scotland at ages 9 and 13 and in Spain at age 9.
- Whereas the majority of students in all the countries reported having completed no more than 1 hour of homework a day at age 9, by age 13 the majority of students in about half these countries completed at least 2 hours of homework daily. In the United States, however, the majority of students still continued to complete no more than 1 hour of homework a day at age 13.
- Nine-year-old students in almost every country studied spent more time on mathematics homework than science homework each week. The same was true for 13-year-olds, with the exception of those in the former Soviet Union, Jordan, and Hungary.

Table 25a: Percentage of students reporting number of hours spent on homework daily,[1] by age and country: 1991

	Age 9			Age 13		
Country	None	1 hour or less	2 hours or more	None	1 hour or less	2 hours or more
G–7[2]						
Canada	29 (1.2)	58 (1.1)	13 (0.6)	8 (0.6)	65 (0.9)	27 (1.0)
France	—	—	—	0 (0.2)	44 (1.6)	55 (1.6)
United States	**20 (1.8)**	**59 (2.0)**	**20 (1.2)**	**10 (1.2)**	**61 (1.7)**	**29 (1.8)**
Other						
Hungary	2 (0.5)	72 (1.4)	25 (1.4)	0 (0.1)	42 (1.3)	58 (1.3)
Ireland	2 (0.4)	80 (1.7)	18 (1.5)	1 (0.5)	35 (1.8)	63 (1.9)
Israel	4 (0.7)	60 (1.6)	35 (1.5)	1 (0.2)	49 (1.9)	50 (1.9)
Jordan	—	—	—	3 (0.5)	40 (1.9)	56 (2.0)
Korea	2 (0.4)	77 (1.1)	22 (1.1)	3 (0.5)	56 (1.6)	41 (1.7)
Scotland	18 (2.8)	78 (3.0)	4 (0.6)	16 (1.4)	70 (1.2)	14 (1.1)
Slovenia	4 (0.7)	81 (1.2)	15 (1.1)	1 (0.2)	70 (1.6)	28 (1.7)
Soviet Union (former)	2 (0.3)	68 (1.4)	31 (1.3)	0 (0.2)	47 (1.6)	52 (1.6)
Spain	15 (1.6)	55 (1.9)	29 (1.8)	1 (0.4)	33 (1.5)	64 (1.5)
Switzerland	—	—	—	1 (0.2)	79 (1.3)	20 (1.3)
Taiwan	2 (0.5)	67 (1.3)	31 (1.2)	4 (0.6)	55 (1.1)	41 (1.3)

—Not available.

[1] All standard errors are in parentheses.

[2] No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 25 for details on indicator calculation for Canada, Israel, Scotland, the former Soviet Union, Spain, Switzerland, and the United States.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992.

Table 25b: Percentage of students reporting number of hours spent weekly on mathematics and science homework,[1] by age and country: 1991

Country	Age 9						Age 13					
	Mathematics			Science			Mathematics			Science		
	0–1 hours	2–3 hours	4 hours or more	0–1 hours	2–3 hours	4 hours or more	0–1 hours	2–3 hours	4 hours or more	0–1 hours	2–3 hours	4 hours or more
G–7[2]												
Canada	72 (0.9)	19 (0.8)	10 (0.6)	80 (0.9)	14 (0.7)	6 (0.5)	58 (1.1)	27 (0.9)	15 (0.8)	83 (0.8)	13 (0.8)	4 (0.3)
France	—	—	—	—	—	—	45 (1.5)	38 (1.4)	17 (1.3)	88 (0.8)	12 (0.7)	1 (0.2)
United States	**65 (1.7)**	**20 (1.1)**	**14 (1.1)**	**78 (1.4)**	**15 (1.3)**	**7 (0.8)**	**63 (2.1)**	**22 (1.5)**	**15 (1.3)**	**76 (1.7)**	**17 (1.2)**	**7 (0.8)**
Other												
Hungary	49 (1.8)	27 (1.4)	23 (1.6)	62 (1.6)	26 (1.2)	12 (1.1)	68 (1.3)	21 (1.2)	11 (0.7)	55 (1.3)	32 (1.4)	13 (0.8)
Ireland	63 (2.1)	22 (1.5)	15 (1.6)	82 (1.5)	12 (1.2)	6 (0.9)	48 (1.6)	35 (1.4)	17 (1.3)	74 (1.6)	21 (1.2)	5 (0.7)
Israel	55 (1.4)	26 (1.2)	19 (1.0)	70 (1.3)	23 (1.1)	7 (0.6)	41 (1.4)	42 (1.3)	17 (1.1)	72 (1.6)	23 (1.3)	4 (0.5)
Jordan	—	—	—	—	—	—	57 (1.5)	29 (1.2)	14 (1.0)	60 (1.6)	28 (1.3)	12 (1.0)
Korea	51 (1.6)	32 (1.2)	17 (1.0)	69 (1.5)	24 (1.0)	7 (0.9)	29 (1.2)	38 (1.1)	33 (1.1)	56 (1.8)	34 (1.6)	9 (1.0)
Scotland	84 (1.4)	12 (1.3)	4 (0.7)	92 (1.2)	5 (0.8)	3 (0.6)	75 (1.6)	21 (1.4)	4 (0.6)	90 (1.2)	8 (1.1)	2 (0.4)
Slovenia	61 (1.7)	24 (1.4)	16 (1.1)	68 (1.7)	21 (1.2)	11 (1.0)	54 (1.5)	32 (1.4)	15 (0.9)	63 (1.3)	30 (1.2)	7 (0.7)
Soviet Union (former)	52 (2.9)	23 (1.4)	25 (2.3)	75 (1.5)	19 (1.3)	6 (0.5)	39 (1.9)	28 (1.0)	33 (1.5)	3 (0.7)	37 (0.8)	59 (0.8)
Spain	46 (2.0)	29 (1.5)	25 (1.6)	51 (2.0)	29 (1.5)	20 (1.6)	52 (1.9)	26 (1.4)	22 (1.3)	58 (1.6)	30 (1.3)	12 (0.9)
Switzerland	—	—	—	—	—	—	51 (1.7)	34 (1.3)	15 (1.2)	89 (1.2)	9 (1.0)	1 (0.4)
Taiwan	50 (1.6)	35 (1.2)	15 (1.3)	58 (1.4)	32 (1.1)	9 (1.0)	47 (1.3)	29 (1.3)	24 (1.2)	64 (1.1)	25 (1.1)	10 (0.8)

—Not available.

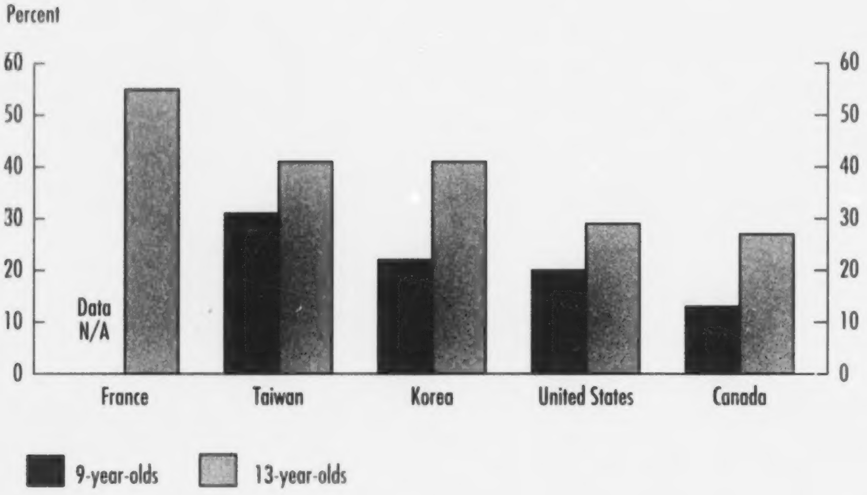
[1] All standard errors are in parentheses.

[2] No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 25 for details on indicator calculation for Canada, Israel, Scotland, the former Soviet Union, Spain, Switzerland, and the United States.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992; *Learning Science*, 1992.

Figure 25a: Percentage of 9- and 13-year-old students who reported doing 2 or more hours of homework per day, by selected country:[*] 1991



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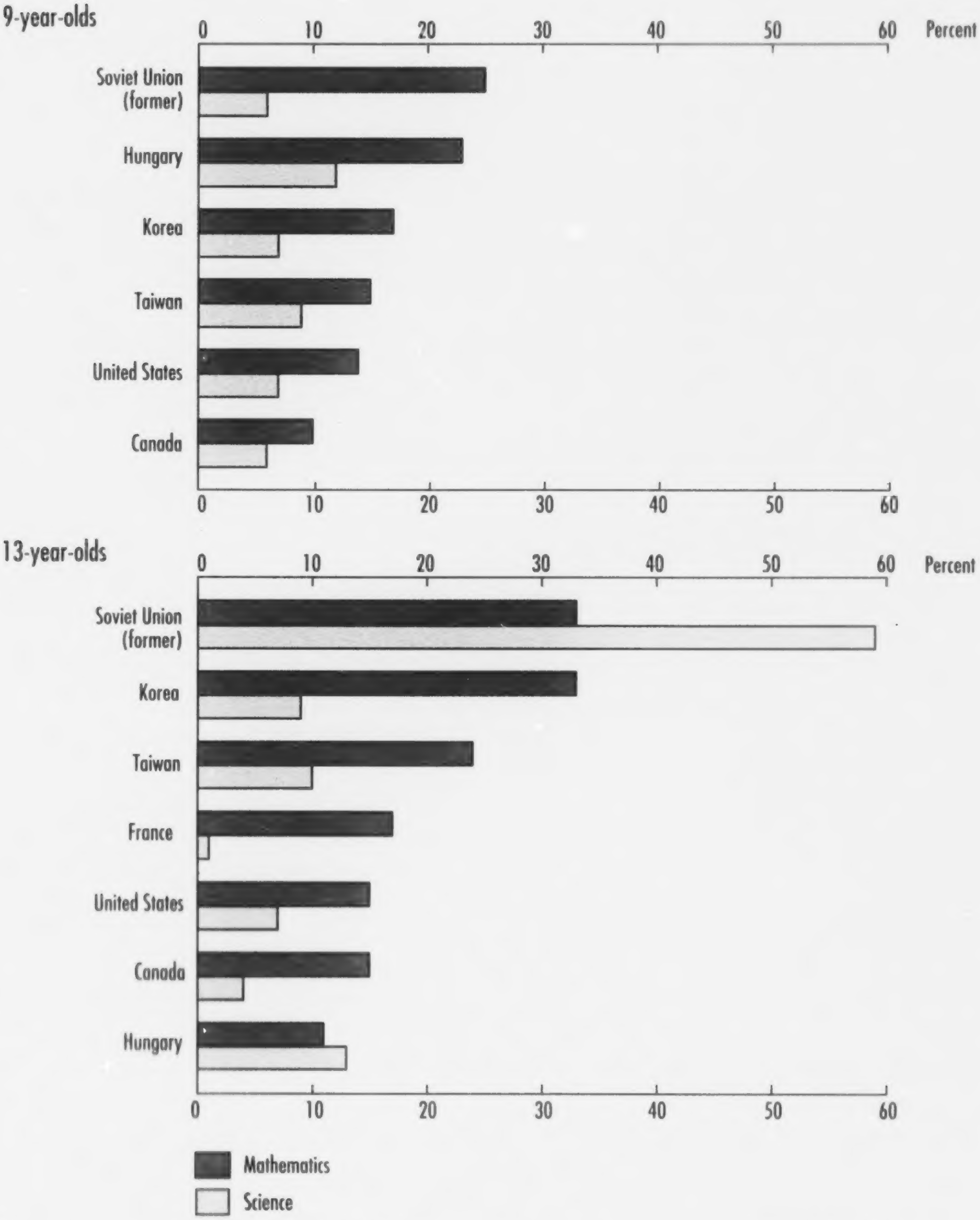
[*] Countries are sorted in descending order by the percentage of 13-year-olds who reported doing 2 or more hours of homework per day.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992.

Figure 25b: Percentage of 9- and 13-year-olds who reported doing at least 4 hours of mathematics or science homework weekly, by selected country:* 1991



*Countries are sorted in descending order by the percentage of 9- and 13-year-olds who reported doing at least 4 hours of mathematics homework weekly.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992.

Indicator 26: Testing in Mathematics and Science Classes

The use of weekly tests or quizzes by teachers provides an indication of the extent of regular monitoring of student progress, which research studies have associated with high student achievement. Weekly tests or quizzes can also provide students with an understanding of formalized tests and test settings, thus preparing them to perform well on other examinations such as national entrance or exit exams. However, as is the case with homework indicators, statistics concerning weekly mathematics and science examinations do not include information about the quality and applicability of the examinations administered or the effort and care students take in completing them.

- With few exceptions, a greater percentage of 13-year-old students in the United States were tested in mathematics and in science on a weekly basis than in other countries for which 1991 data were available (68 percent of U.S. students were tested weekly in mathematics and 69 percent were tested weekly in science).
- The variation in the percentage of 13-year-olds tested weekly in these two subjects was quite wide among the countries surveyed, ranging from 17 to 87 percent in mathematics (in Hungary and Taiwan, respectively) and from 18 to 88 percent in science (18 percent in Ireland, Slovenia, and Switzerland, and 88 percent in the former Soviet Union).
- In most of the countries surveyed, more 13-year-old students took weekly mathematics tests than science tests. However, in Hungary, Jordan, the former Soviet Union, and Spain, more students took science tests than mathematics tests; and in the United States and Ireland, the percentages of students taking weekly examinations were roughly equal for both subjects.

Table 26: Percentage of 13-year-old students who took a test or quiz at least once a week,[1] by subject and country: 1991

Country	Mathematics	Science
G–7[2]		
Canada	53 (0.9)	26 (1.1)
France	64 (1.3)	47 (1.4)
United States	**68 (2.1)**	**69 (2.0)**
Other		
Hungary	17 (1.3)	27 (1.6)
Ireland	19 (1.5)	18 (1.1)
Israel	36 (2.2)	28 (1.9)
Jordan	68 (1.5)	73 (1.8)
Korea	28 (1.9)	21 (1.6)
Slovenia	28 (1.5)	18 (1.0)
Soviet Union (former)	52 (1.5)	88 (1.2)
Spain	31 (1.7)	42 (2.6)
Switzerland	40 (2.5)	18 (1.2)
Taiwan	87 (1.1)	67 (1.2)

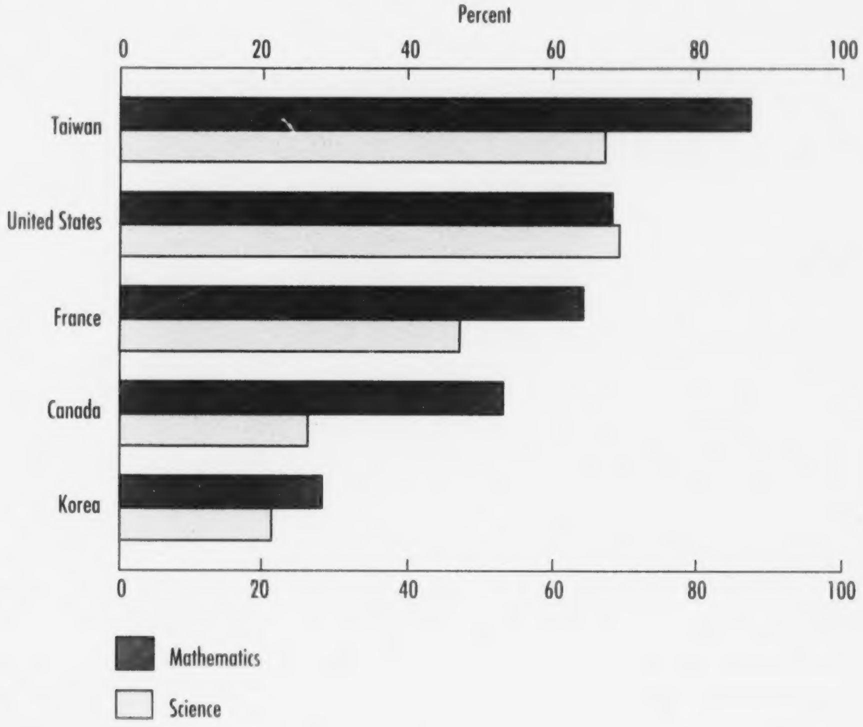
[1] Jackknifed standard errors are in parentheses.

[2] No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 26 for details on indicator calculation for Canada, Israel, the former Soviet Union, Spain, Switzerland, and the United States.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Science*, 1992; *Learning Mathematics*, 1992.

Figure 26: **Percentage of 13-year-old students who took a mathematics or science test or quiz at least once a week, by selected country:* 1991**



*Countries are sorted in descending order by the percentage of 13-year-olds who took a mathematics test or quiz at least once a week.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992; *Learning Science*, 1992.

Indicator 27: Scientific Experimentation

The percentage of 9- and 13-year-old students who conduct experiments in their science classes provides an indication of the application of scientific knowledge through experimentation. While there is no strong evidence of a direct link between the frequency with which students conduct experiments in science and their performance on science achievement tests, scientific experimentation is still valuable as it helps to develop the skills of methodological inquiry and deductive reasoning that are considered critical to the discipline. National and local goals are currently being developed in the United States with a strong emphasis on the importance of hands-on activities. Although this indicator provides information about the percentage of 9- and 13-year-old students who conduct experiments in their science classes, it does not tell us about the frequency with which students conduct scientific experiments or about the kinds of experiments they perform.

- In 1991, approximately 78 percent of 9-year-olds and 75 percent of 13-year-olds in the United States indicated that they conducted experiments in science class during the school year. The variation in the percentage of 9- and 13-year-olds who had never conducted experiments in science was quite wide among the countries reported, ranging from 10 to 50 percent for 9-year-olds in Taiwan and Ireland, respectively, and from 13 to 51 percent for 13-year-olds in the former Soviet Union and Spain, respectively.

Table 27: Percentage of students who never[1] conduct science experiments,[2] by age and country: 1991

Country	9-year-olds	13-year-olds
G–7[3]		
Canada	26.6 (1.0)	13.1 (0.7)
France	—	20.1 (1.7)
United States	**21.7 (1.3)**	**25.5 (1.9)**
Other		
Hungary	40.2 (1.3)	30.6 (1.7)
Ireland	50.1 (2.0)	26.8 (2.1)
Israel	14.1 (1.1)	34.5 (1.4)
Jordan	—	26.3 (1.4)
Korea	18.6 (1.1)	34.9 (1.7)
Slovenia	21.4 (1.1)	22.0 (1.5)
Soviet Union (former)	43.7 (1.2)	12.7 (0.8)
Spain	40.3 (2.2)	51.0 (2.3)
Switzerland	—	35.8 (1.7)
Taiwan	10.4 (0.8)	25.1 (1.3)

—Not available.

[1] "Never" means not during the most recent school year.

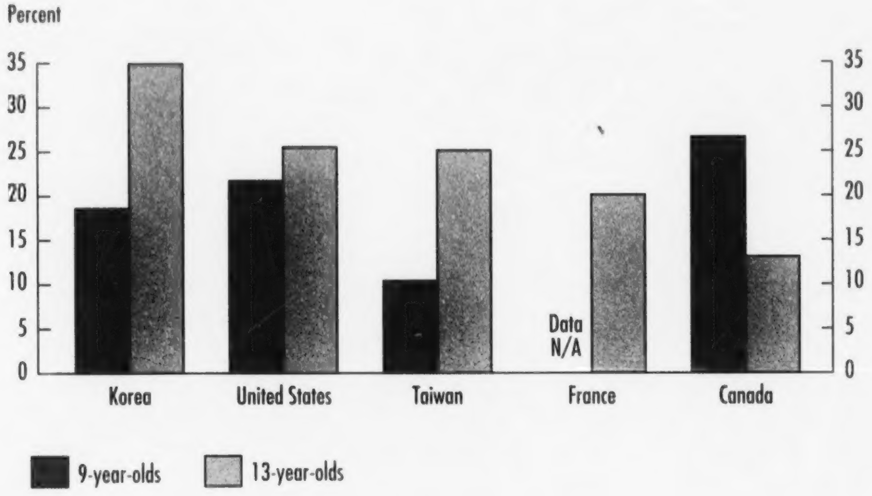
[2] Jackknifed standard errors are in parentheses.

[3] No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 27 on indicator calculation for Canada, Israel, the former Soviet Union, Spain, Switzerland, and the United States.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, Report 12, *Background Questions and Proficiency Scores for all Populations*, 1992; Report 13, *Background Questions and Proficiency Scores for all Populations*, 1992.

Figure 27: Percentage of students who never conduct science experiments, by age and selected country:[*] 1992



[*] Countries are sorted in descending order by the percentage of 13-year-old students who never conduct science experiments.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, Report 12, *Background Questions and Proficiency Scores for all Populations*, 1992; Report 13, *Background Questions and Proficiency Scores for all Populations*, 1992.

Indicator 28: Calculator Use

The use of calculators in schools has received increasing attention over the past several years.* This indicator, the percentage of 13-year-old students who have used calculators in school, is influenced by such factors as the availability of calculators in different countries, as well as by policies on calculator use in schools.

- In 1991, a relatively large percentage of 13-year-old students in Canada (75 percent), France (94 percent), and Hungary (71 percent) used calculators in school. In contrast, a relatively small percentage of 13-year-olds in other countries (e.g., Korea, at 4 percent) used calculators in school. With 54 percent of its 13-year-old students using calculators in school, the United States was in the middle.
- The percentage of 13-year-old students who used calculators in school varied dramatically, from about 4 percent in Korea to 94 percent in France. In some cases, calculator use appeared related to the percentage of students in each country who had a calculator; for example, only 20 percent of 13-year-olds in Korea had a calculator, while 98 percent of 13-year-olds in France did.

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*For information concerning calculator use in U.S. schools, see National Council of Teachers of Mathematics, *Curriculum and Evaluation Standards for School Mathematics* (Reston, VA: 1989), 84.

Table 28: Percentage of 13-year-old students who have a calculator and who ever use calculators in school,[1] by country: 1991

Country	Percent of students who:	
	Have calculators	Have used calculators in school
G–7[2]		
Canada	91.1 (0.5)	74.7 (1.3)
France	97.9 (0.3)	94.2 (0.5)
United States	**88.5 (0.9)**	**53.6 (3.5)**
Other		
Hungary	86.7 (1.0)	71.0 (1.6)
Ireland	57.5 (1.6)	25.3 (2.2)
Israel	93.6 (0.7)	48.5 (2.3)
Jordan	52.7 (1.9)	5.4 (0.8)
Korea	20.3 (1.1)	3.7 (0.5)
Slovenia	85.6 (1.1)	46.1 (2.5)
Soviet Union (former)	46.6 (5.0)	19.2 (2.1)
Spain	85.9 (1.3)	45.0 (2.8)
Switzerland	84.9 (1.2)	51.3 (3.1)
Taiwan	57.7 (1.3)	62.2 (1.0)

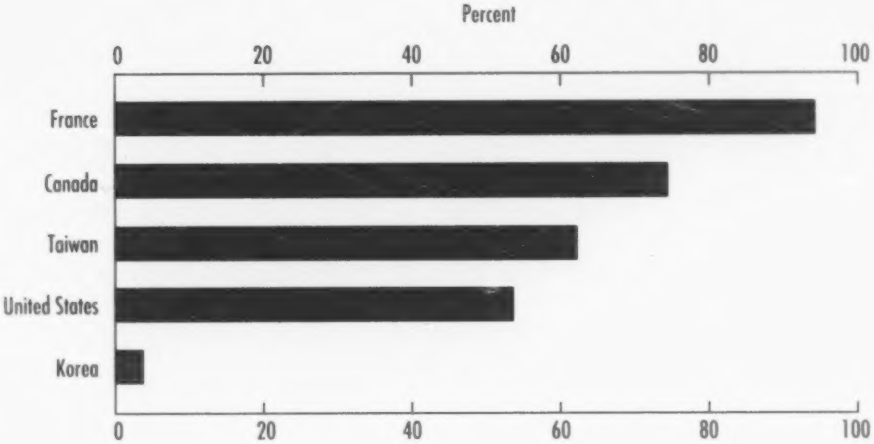
[1] Standard errors are in parentheses.

[2] Data not available for Germany, Italy, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 28 on indicator calculation for Canada, Israel, the former Soviet Union, Spain, Switzerland, and the United States.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, Report 13, *Background Questions and Proficiency Scores for all Populations*, 1992.

Figure 28: Percentage of 13-year-old students who reported ever using calculators in school, by selected country: 1991



SOURCE: Educational Testing Service, International Assessment of Educational Progress, Report 13, *Background Questions and Proficiency Scores for All Populations*, 1992.

Indicator 29: Computer Use

Information about computer use in schools is valuable as countries contemplate the role of computers in education. The percentage of schools using computers for instructional purposes reflects, in part, national policies on the introduction of computers into education, whereas the student/computer ratio provides a measure of student access to computers. These data, however, do not address the quality of computer hardware and software, the amount of time students have access to computers, how computers are used in instruction, or the subjects or activities in which students typically use computers.

- By 1989, all of the U.S. primary, middle or junior high, and high schools responding to the survey had introduced computers for instructional purposes. Of the G–7 countries for which data were available, only France had a similarly high percentage of primary schools that used computers for these purposes. At higher levels of education, however, the introduction of computers into schools increased. To illustrate, in all of the G–7 countries reported except Italy, close to 100 percent of upper secondary* schools were using computers for instructional purposes.
- Among all of the countries reported, the United States had one of the lowest ratios of students to computers across all education levels; the ratios were 23, 18, and 15 for primary, middle or junior high, and high school, respectively. The only schools with fewer students per computer than the United States at the same education level were Japanese primary schools. For those G–7 countries for which data were available, the student/computer ratios ranged from 14 (Japan) to 116 (Italy) in primary school, 18 (United States) to 143 (Japan) in lower secondary school, and 15 (United States) to 48 (former West Germany) in upper secondary school.

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* For further information on school levels, see the sidebar entitled *ISCED levels of education.*

Table 29: Percentage of schools using computers for instructional purposes and median student/computer ratio, by level of education[1] and by country: 1989

Country	Percentage of schools using computers			Student/computer ratio[2]		
	Primary	Lower secondary	Upper secondary	Primary	Lower secondary	Upper secondary
G–7[3]						
France	92	99	99	23	31	26
West Germany (former)	—	94	100	—	47	48
Italy	43	58	80	116	90	36
Japan	12	35	94	14	143	32
United States	**100**	**100**	**100**	**23**	**18**	**15**
Other						
Austria	—	50	100	—	29	46
Belgium (Flemish)	—	78	98	—	28	35
Belgium (French)	54	93	93	28	34	38
British Columbia (Canada)	99	100	100	—	—	—
China	—	—	64	—	—	43
Greece	—	5	4	—	52	44
Hungary	—	—	100	—	—	27
India	—	—	8	—	—	95
Israel	62	—	81	25	—	29
Luxembourg	—	100	—	—	45	—
Netherlands	53	87	68	63	26	34
New Zealand	78	99	100	62	34	38
Poland	—	—	75	—	—	53
Portugal	29	53	72	301	287	289
Slovenia	—	—	94	—	—	50
Switzerland	—	64	98	—	21	21

—Not available.

[1] For the purposes of this study, primary refers to grades 4–6, lower secondary refers to grades 7–9, and upper secondary refers to the final year of secondary education.

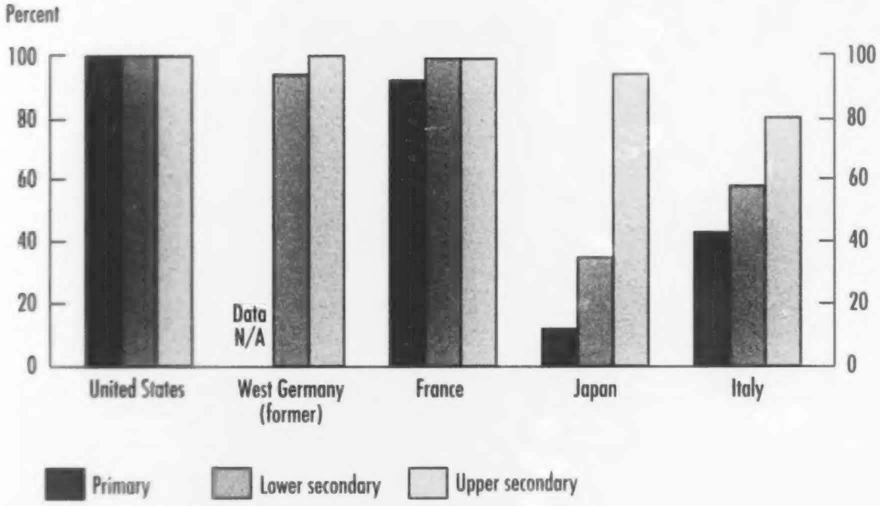
[2] Median student/computer ratio in computer-using schools. Computer-using schools refers to all schools in which computers are used for teaching and learning purposes in grades in which the modal age of students is 9, 10, and 11 for primary, and 12, 13, and 14 for lower secondary; and in the final and penultimate secondary grade for upper secondary.

[3] No data available for Canada and the United Kingdom.

NOTE: There is substantial variation across countries in the population of schools and students covered by the study. See supplemental note to Indicator 29 for sampling information.

SOURCE: W. J. Pelgram and T. Plomp, ed., *The IEA Study of Computers in Education: Implementation of an Innovation in 21 Education Systems*, (New York: Pergamon Press, 1993).

Figure 29a: Percentage of schools using computers for instructional purposes, by education level and selected G–7 country:[1,2] 1989

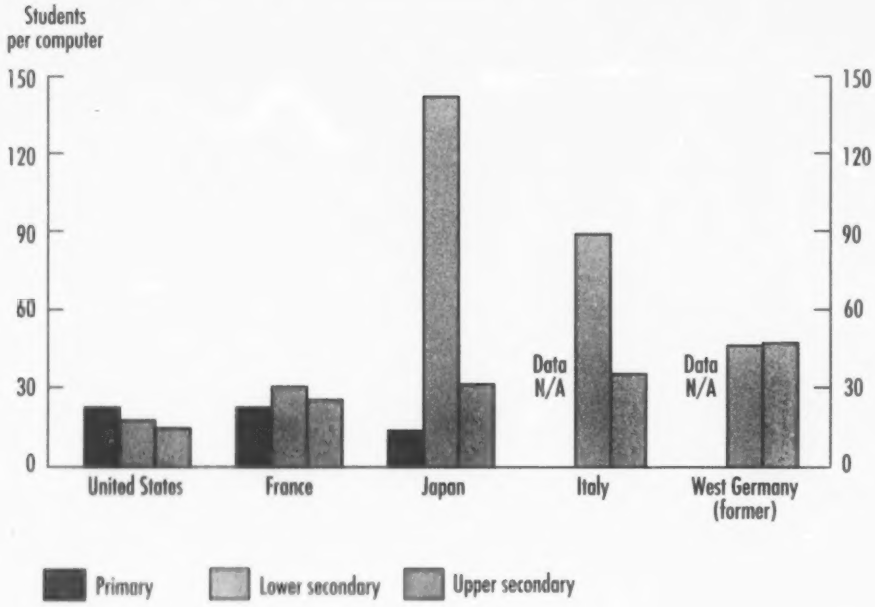


[1] No data available for Canada and the United Kingdom.

[2] Countries are sorted in descending order by the percentage of schools using computers for instructional purposes at the upper secondary level.

SOURCE: W. J. Pelgram and T. Plomp, ed., *The IEA Study of Computers in Education: Implementation of an Innovation in 21 Education Systems*, (New York: Pergamon Press, 1993).

Figure 29b: Ratio of students to computers, by education level and selected G–7 country:[1,2] 1989



[1] No data available for Canada and the United Kingdom.

[2] Countries are sorted in ascending order by student/computer ratio in upper secondary school.

SOURCE: W. J. Pelgram and T. Plomp, ed., *The IEA Study of Computers in Education: Implementation of an Innovation in 21 Education Systems*, (New York: Pergamon Press, 1993).

CONTEXTUAL FACTORS

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CONTEXTUAL FACTORS

Much of what goes on outside of the school forms a context within which the education system operates. For instance, a country's education system must accommodate the specific demographics of its population as well as economic and other conditions affecting society.

In several ways, the United States stands out starkly from the other countries reported in this section. With 252 million people, the United States has by far the largest population of any of the countries to which it is typically compared. Japan, the second most populous country, has half as many people; and Germany, the third most populous country, has about a third as many residents. In addition, the United States is one of three countries with a larger land area—by a factor of at least 10—than any of the other countries reported. The other two countries with large land areas are Canada and Australia. The fourth largest country, Turkey, is a tenth as large as Australia (Indicator 30). Finally, the percentage of children living in poverty after tax and transfer (approximately 20 percent) is more than twice as high in the United States as in any of the other countries for which data were reported (Indicator 35).

These profound differences between the United States and many other industrialized countries have major ramifications for the education system. Governance structures in the United States must be suited to a large population and land area, and services provided by schools must reflect the fact that a sizable proportion of students live below the poverty level.

One area in which there was a noticeable difference between the United States and its economic competitors 30 years ago, but no longer today, is productivity—gross domestic product (GDP) per employed person. In 1961, with the exception of Canada, all of the G–7 countries as well as the other countries for which data were available had productivity levels no greater than half as large as that of the United States. But in recent years, the gap has narrowed greatly. Although the United States still has the highest productivity, the index for all of the G–7 countries is 75 percent of the United States or greater (Indicator 34).

While the context within which the U.S. education system operates differs in some ways from that of other countries, in many other areas its context is similar to that of other countries. To illustrate, the percentage of the population that is 5–29 years old is similar in the United States and the other G–7 countries (Indicator 31). Additionally, while the United States has the highest GDP per capita of all the countries reported (approximately $18,000), three other G–7 countries had a GDP per capita that neared that of the United States (at least $15,000) (Indicator 33).

The United States is also similar to other countries in the percentage of 9- and 14-year-olds who usually speak a different language at home than is spoken at school (Indicator 32), 13-year-old students reporting having fewer than 25 books in their home (Indicator 36), and 13-year-old students who receive help at home with homework (Indicator 37). Thus, in many ways, the resources available for education and the home environment of young students are not very different in the United States than in other countries.

Indicator 30: Population and Land Area

A country's population and land area influence both the organizational structure and the infrastructure of its education system. Countries with large populations have large numbers of school-age children and face a greater demand for educational services. Countries with large areas face greater challenges in providing educational services, since the sources must spread them over a wider geographical domain. High population densities may make it more efficient to support a wider range of specialized education and training opportunities. Although these factors influence the degree to which an education system is centralized and its ability to provide a wide range of services, they only become critical when population, area, or density is either extremely large or extremely small. Otherwise, factors such as culture, history, and economics have a stronger influence on the structure of an education system.

- With a population of over 252 million people in 1991, the United States was by far the most populous of the countries presented. Its population was over twice as large as that of Japan, the country with the next largest population.
- Canada, Australia, and the United States were by far the largest countries. With all others smaller than 300,000 square miles, these three countries were each about 3 million square miles or larger.
- Related to its large size, the United States also has a relatively low population density. The other G–7 countries, with the exception of Canada, were between nearly 4 and over 11 times more densely populated than the United States.

Table 30: Population, area, and population density, by country: 1991

Country	Total population (thousands)	Area (square miles)	Population density (persons per square mile)
G–7			
Canada	26,835	3,560,219	8
France	56,596	210,668	269
Germany	79,548	135,236	588
Italy	57,772	113,521	509
Japan	124,017	152,411	814
United Kingdom	57,515	93,278	617
United States	**252,502**	**3,539,227**	**71**
Other			
Australia	17,288	2,941,285	6
Austria	7,666	31,942	240
Belgium	9,922	11,672	850
Czechoslovakia	15,725	48,440	325
Denmark	5,133	16,359	314
Finland	4,991	117,942	42
Hungary	10,558	35,653	296
Ireland	3,489	26,598	131
Luxembourg	388	998	389
Netherlands	15,022	13,104	1,146
New Zealand	3,309	103,734	32
Norway	4,273	118,865	36
Portugal	10,388	35,382	294
Spain	39,385	192,819	204
Sweden	8,564	158,927	54
Switzerland	6,784	15,355	442
Turkey	58,581	297,591	197

SOURCE: U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census, *Statistical Abstract of the United States*, 1992, table 1359.

Figure 30a: Land area, by G-7 country:[1] 1991

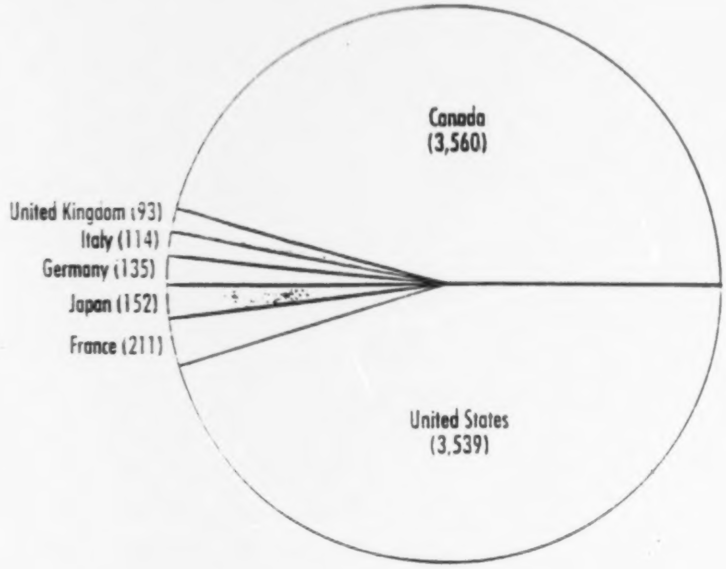
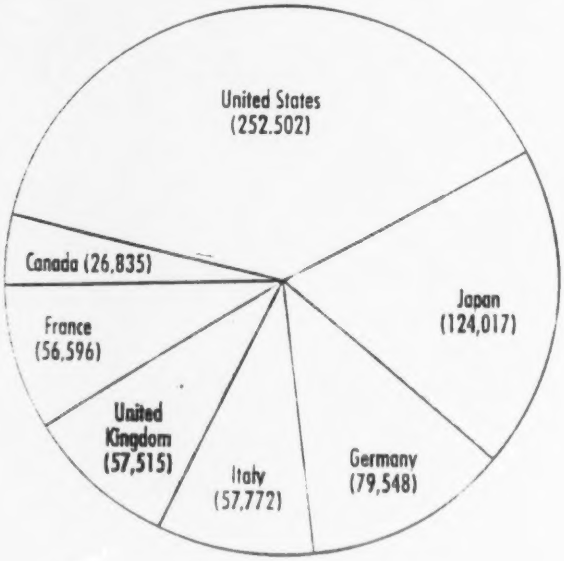


Figure 30b: Population, by G-7 country:[2] 1991



[1] In thousands of square miles.

[2] In thousands.

SOURCE: *Statistical Abstract of the United States*, 1992, Table 1359.

Indicator 31: Youth and Population

The percentage of a country's population who are 5–29 years old is an indicator of the potential demand for school enrollments in a country. This percentage also indicates the potential demand placed on national budgets for education funding. Thus, countries with higher proportions of youth tend to have a greater demand for education funding, and changes in the proportion of youth in the population over time tend to parallel trends in the demand for such funding. The percentage is not an exact measure of the proportion of students in a population, however, since some persons aged 5–29 will not be students and some students will be outside this age range. If such variations are considered, the percentage of persons aged 5–14 generally indicates current demand for education services at the primary and middle or junior high level and future demand for higher education services, whereas the percentage of persons aged 15–24 and 25–29 reflects current demand for upper secondary and higher education resources.

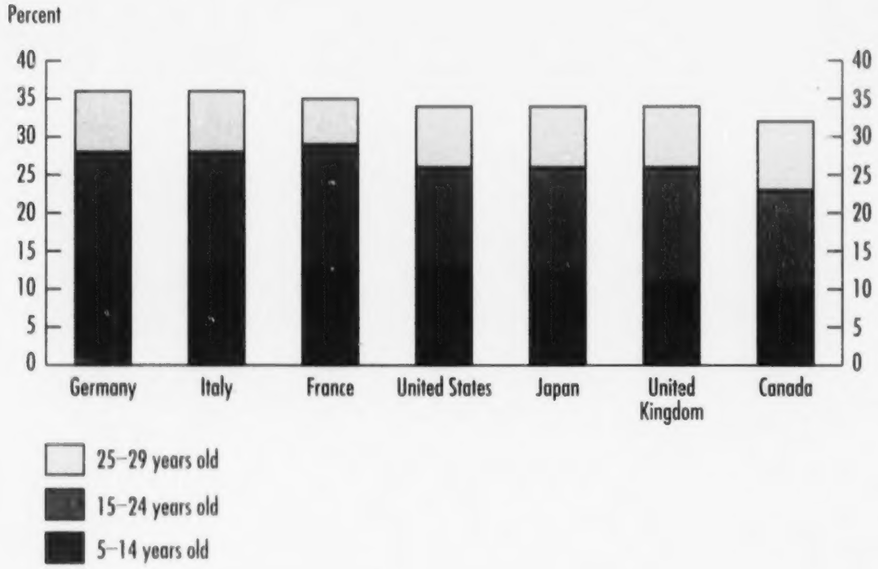
- In 1992, 5- to 29-year-olds comprised approximately one-third of the population of all the G–7 countries, including the United States. Of the remaining countries, less than half had a higher proportion of youth in their population than did the United States.

Table 31: Percentage of population 5–29 years of age, by country: 1992

	Age groups in population			
Country	**5–29**	**5–14**	**15–24**	**25–29**
G–7				
Canada	35	13	13	8
France	36	13	15	8
Germany	32	10	13	9
Italy	35	11	15	8
Japan	35	13	16	6
United Kingdom	35	12	14	8
United States	**36**	**14**	**14**	**8**
Other				
Australia	38	14	16	8
Austria	35	12	15	9
Belgium	33	12	13	8
Czech Republic	37	14	15	7
Denmark	33	11	14	8
Finland	33	13	13	8
Greece	35	13	15	8
Hungary	35	14	15	6
Ireland	43	19	17	7
Netherlands	35	12	15	9
New Zealand	39	15	16	8
Norway	35	12	15	8
Poland	38	17	14	7
Portugal	42	15	18	10
Russia	36	16	13	7
Spain	39	14	17	8
Sweden	32	11	13	7
Switzerland	33	11	13	9
Turkey	50	22	20	8

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 31: Percentage of the population 5–29 years of age by G–7 country:* 1992



*Countries are sorted in descending order by the percentage of the population 5–29 years old.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 32: Home and School Language

The percentage of 9- and 14-year-old students who report speaking a language at home other than the one used at their school reflects the availability of home resources for practicing the official school language. Language diversity within an education system presents additional challenges to schools if students who speak a different language at home are just learning the school language. The data presented here are based on the opinions of students and on their perception of their linguistic situation. The high percentage of Italian and Swiss primary and secondary school students who speak a language other than the official school language at home is likely due to several factors. In Italy, students who speak a particular dialect at home may perceive it as a different language than the Italian used at school. As a result of internal migration, some students in Switzerland attend schools that provide instruction in a language other than the one spoken at home (Switzerland has four regionally based national languages).

- Compared with the other G–7 countries for which data were available, a relatively small percentage of 9- and 14-year-olds in the United States spoke a different language at home than at school in 1991, 3 and 4 percent, respectively. Of these countries, Italy had the highest percentage of both 9-year-olds (27 percent) and 14-year-olds (26 percent) who spoke a different language at home than at school.
- The percentage of students who reported they usually speak a language other than the official school language at home ranged from less than 5 percent for both age groups (in the United States, Finland, Iceland, Ireland, Norway, and Portugal) to more than 10 percent for both age groups (in Italy, Spain, and Switzerland).

Table 32: Percentage of all 9- and 14-year-olds who say that they usually[1] speak a language other than the official school language at home, by country: 1991[2]

Country	9-year-olds	14-year-olds
G–7[3]		
France	9 (1.4)	4 (0.5)
West Germany (former)	10 (0.9)	8 (0.9)
Italy	27 (1.5)	26 (1.1)
United States	**3 (0.5)**	**4 (0.8)**
Other		
Belgium (French community)	11 (1.2)	9 (1.1)
Denmark	5 (0.6)	2 (0.5)
Finland	1 (0.3)	1 (0.2)
Greece	6 (1.0)	3 (0.9)
Iceland	3 (0.2)	0 (0.0)
Ireland	3 (0.7)	1 (0.0)
Netherlands	12 (2.1)	9 (1.3)
New Zealand	8 (1.0)	6 (0.7)
Norway	4 (0.7)	2 (0.4)
Portugal	3 (0.6)	2 (0.3)
Spain	13 (1.4)	11 (1.2)
Sweden	9 (1.2)	5 (0.6)
Switzerland	21 (1.2)	15 (0.9)

[1] The figures reported here represent the percentage of all 9- and 14-year-olds who sometimes, hardly ever, or never spoke the school language at home.

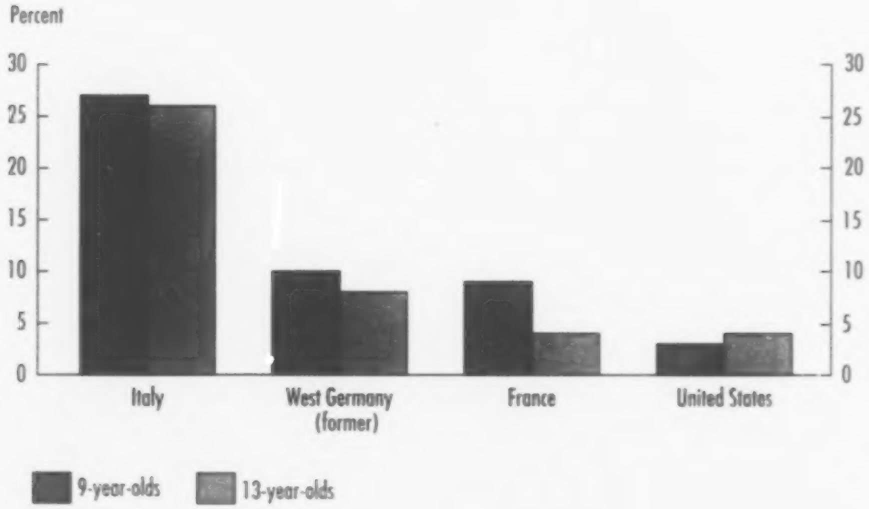
[2] Standard errors are in parentheses.

[3] No data available for Canada, Japan, and the United Kingdom.

NOTE: See supplemental note to Indicator 32 for information on desired target populations for the IEA Reading Literacy Study.

SOURCE: The International Association for the Evaluation of Educational Achievement, IEA Reading Literacy Study, 1992.

Figure 32: Percentage of 9- and 14-year-olds who say that they usually speak a language other than the official school language at home, by G–7 country:[1,2] 1991



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[1] No data available for Canada, Japan, and the United Kingdom.

[2] Countries are sorted in descending order by the percentage of 9-year-olds who say that they usually speak a language other than the official school language at home.

SOURCE: International Association for the Evaluation of Educational Achievement, IEA Reading Literacy Study, 1992.

Home and school language differences

In both the United States and Western Europe, the number of students whose home language is different from the language spoken at school is rapidly increasing. The number of children in the United States whose parents are immigrants is expected to grow from 5.1 million to 7.4 million between 1990 and 2000 and to 9.1 million in 2010.[1] In Western Europe, the number of students who are not citizens of the country—generally referred to in Europe as "foreigners"—increased 26 percent in Germany, 17 percent in the Netherlands, and 11 percent in Switzerland between the mid-1980s and early 1990s.[2] During the same period, the number of students in Norway speaking a language other than Norwegian increased 136 percent and the number in Sweden speaking a language other than Swedish increased 30 percent.[3] These increases are largely the result of increased immigration. Thus, the image of European countries with relatively homogeneous populations is increasingly outdated.

In addition to immigrants, there are students both in the United States and in other countries who belong to groups who either are indigenous to the area or have lived in the country for several generations and whose home language is not the school language. Examples in the United States include Native Americans and some of the Mexican-Americans in the Southwest. Similarly, most European countries include at least one permanent group speaking a language different from the majority language. In France, for example, there are groups who speak Basque, Breton, Catalan, Corsican, Flemish, and a dialect of German.[4]

In many Western European countries, as well as in the United States, schools are under increasing pressure to find strategies to address the special needs of students whose home language is not the language used in school. These strategies have been influenced by the national and local sentiment regarding culture and language, attitudes toward immigration, and the available education resources.

In the United States, existing state and local policies have been shaped by the *Lau vs. Nichols* Supreme Court decision of 1974, which required that students who do not speak and understand English are entitled to education programs that teach them English and allow them to participate in the overall educational program of their schools.[5] The National Bilingual Education Act of 1968 first authorized federal funds to support special programs for such students. English-as-a-second-language is now regarded as a standard part of the curriculum for students with limited English proficiency. Further, many bilingual programs provide instruction in regular academic subjects in students' home language in order for students to maintain grade-level standards while developing English proficiency. However, although there are instances in which bilingual education incorporates maintenance and enhancement of home language skills, the dominant approach has been for bilingual programs to be primarily transitional in nature, intended to serve students only until they acquire English proficiency.

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[1] M. Fix and J. Passel, *Immigration and Immigrants: Setting the Record Straight* (Washington, D.C.: The Urban Institute, 1994).

[2] OECD, *Trends in International Migration, 1993* (Paris: SOPEMI, 1994), 126–139. Base year is school year 1991–92 for Germany and Norway and 1990–91 for the Netherlands, Sweden, and Switzerland.

[3] OECD, *Trends in International Migration*, 54.

[4] T. Husen, A. Tuijnman, and W.D. Halls, *Schooling in Modern European Society* (Oxford: Pergamon Press, 1992).

The approach has been quite different in Europe, where preserving the cultural identity of the students who belong to groups speaking a language at home different from the language of the school has been a longstanding educational goal. Twenty years ago, immigration was generally viewed as a temporary phenomenon and education of immigrants' children was largely organized by their country of origin and financed privately. When it became clear that large numbers of immigrants would remain in the host country, the responsibility for providing education shifted to the public domain. In 1977, a European Community directive called on host countries to "take specific measures for immigrants' children and, in cooperation with the countries of origin, to promote the teaching of the mother tongue and the culture of the country of origin."[6]

For example, municipal authorities in Sweden are required to organize home-language instruction for all pupils using a language other than Swedish for everyday communication with at least one parent. In addition to developing their home language, this instruction aims to help students preserve links with their families and their own language group. Depending on the situation, the home language may also be used for instruction in other subjects. Swedish as a second language is compulsory for all pupils who need it.[7]

More recently, a viewpoint has arisen in Europe—partly in response to low achievement of foreigners—that for students whose home language is different from the school, greater emphasis should be placed on promoting "a uniform scientific and technical education, presented as being culturally neutral."[8] According to this reasoning, schools should focus on giving students the skills they will need in the workplace, rather than on preserving the culture and language of their country of origin. Furthermore, questions have been raised in the United States and other countries about whether public education systems are the best institutions for maintaining these cultural links. However, in contrast to the United States in the 20th century, the prevailing assumption in Europe is that it is not inappropriate for public schools to contribute to the maintenance of the students' home language and culture.

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[5] Up until the late 1800s, it was not unusual for schools in the United States to provide instruction in English and a second language. By the mid-1800s, public and parochial schools providing instruction in German and English operated in such cities as Baltimore, Cincinnati, Indianapolis, Milwaukee, and St. Louis. In some cases, laws stipulated that at the request of parents, instruction should be provided in languages other than English. (J. Crawford, *Bilingual Education: History, Politics, Theory, and Practice* [NJ: Crane Publishing Company, 1989].)

[6] D. Blot, *Issues Concerning the Education of Immigrants' Children* (Paris: OECD, 1994).

[7] In 1990/91, 12 percent of the students in compulsory education in Sweden had a mother tongue other than Swedish. (Swedish Ministry of Education and Science, *The Swedish Way Towards a Learning Society* [Stockholm: 1992].)

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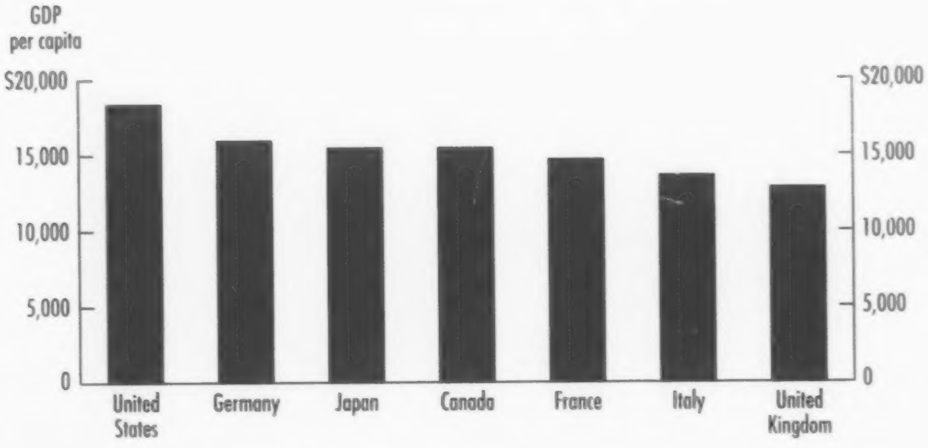
[8] D. Blot, *Issues Concerning the Education of Immigrants' Children.*

Indicator 33: GDP Per Capita

Gross domestic product (GDP) is an aggregate measure of the value of goods and services produced in a country within a year. It is an indicator of a country's productive capacity or economic power. GDP *per capita* provides a measure of a country's economic power adjusted by the size of its population. Countries with larger per capita GDPs are generally better able to provide educational services for their residents.

- The United States had the highest GDP per capita ($18,360) of the G–7 countries in 1992. In the remaining G–7 countries, GDP per capita ranged from $12,820 (in the United Kingdom) to $15,940 (in Germany). The United States also had the highest GDP per capita of the other countries reported, followed by Switzerland and Luxembourg ($17,400 and $17,080, respectively).
- Portugal and Turkey had by far the lowest GDP per capita of the countries reported ($7,210 and $3,960, respectively).

Figure 33: GDP per capita (in 1990 U.S. dollars), by G–7 country: 1992



SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Table 33: GDP per capita, by country: 1992

Country	GDP per capita
G–7	
Canada	$15,440
France	14,670
Germany	15,940
Italy	13,620
Japan	15,450
United Kingdom	12,820
United States	**18,360**
Other	
Australia	13,900
Austria	14,240
Belgium	14,000
Denmark	14,100
Finland	12,000
Ireland	9,940
Luxembourg	17,080
Netherlands	13,630
New Zealand	11,270
Norway	13,920
Portugal	7,210
Spain	10,110
Sweden	13,650
Switzerland	17,400
Turkey	3,960

NOTE: All currencies first were converted to U.S. dollars at 1985 price levels using the Purchasing Power Parity (PPP) index. The results were then converted to U.S. dollars at 1992 price levels using implicit price deflators for gross domestic product in 1985 and 1992 listed in *Economic Report of the President*, January 1993. Consult the glossary for an explanation of the PPP index. See supplemental note to Indicator 33 for details on indicator calculations for Australia, Canada, Finland, Japan, New Zealand, Sweden, the United Kingdom, and the United States.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 34: Productivity

Productivity, defined as the gross domestic product per employed person, is a measure of the average productive capacity of a country's employees. Countries with higher levels of productivity have a larger economic capacity from which to invest in socioeconomic infrastructure, improve education, and raise their citizens' standard of living.

- In 1961, the United States had the highest productivity level of all countries presented (including the G–7 countries), in large part due to the impact of World War II. Productivity levels of the G–7 countries ranged from 26 percent (Japan) to just under 75 percent (Canada) of that of the United States.
- In 1991, U.S. productivity was still above that of the other countries reported, but productivity levels had converged considerably. For instance, the productivity levels of the G–7 countries ranged from 75 percent (United Kingdom) to 98 percent (France) of that of the United States.
- Between 1961 and 1991, the United States experienced the lowest average annual increase in productivity of all the countries presented (1.05 percent). Japan achieved the highest productivity gains of the remaining countries, with an average annual increase of 4.8 percent.

Table 34: Productivity[1] as a percentage of U.S. productivity (based on 1990 purchasing power parities,[2] U.S.=100) and average annual percentage increase in productivity, by country: 1961–91

	Productivity as a percentage of U.S. productivity				**Average annual percent increase in productivity[4]**
	Year				
Country	**1961**	**1971**	**1981**	**1991[3]**	**1961–91**
G–7					
Canada	72.4	77.1	84.2	87.3	1.68
France	52.6	69.3	86.2	98.0	3.17
West Germany (former)	55.2	68.3	82.7	90.1	2.71
Italy	46.3	65.9	85.5	94.2	3.47
Japan	26.4	47.3	64.4	79.0	4.80
United Kingdom	55.8	60.6	69.0	74.8	2.04
United States	**100.0**	**100.0**	**100.0**	**100.0**	**1.05**
Other					
Austria	44.6	60.9	75.3	85.6	3.27
Belgium	55.3	68.2	87.4	98.0	2.99
Denmark	56.1	61.3	67.8	74.3	2.00
Korea	—	17.3	25.4	43.9	—
Netherlands	59.2	73.2	82.2	82.5	2.17
Norway	45.9	52.2	64.8	74.7	2.70
Sweden	54.2	62.4	66.6	69.6	1.89

—Not available.

[1] Productivity is defined as the gross domestic product per employed person.

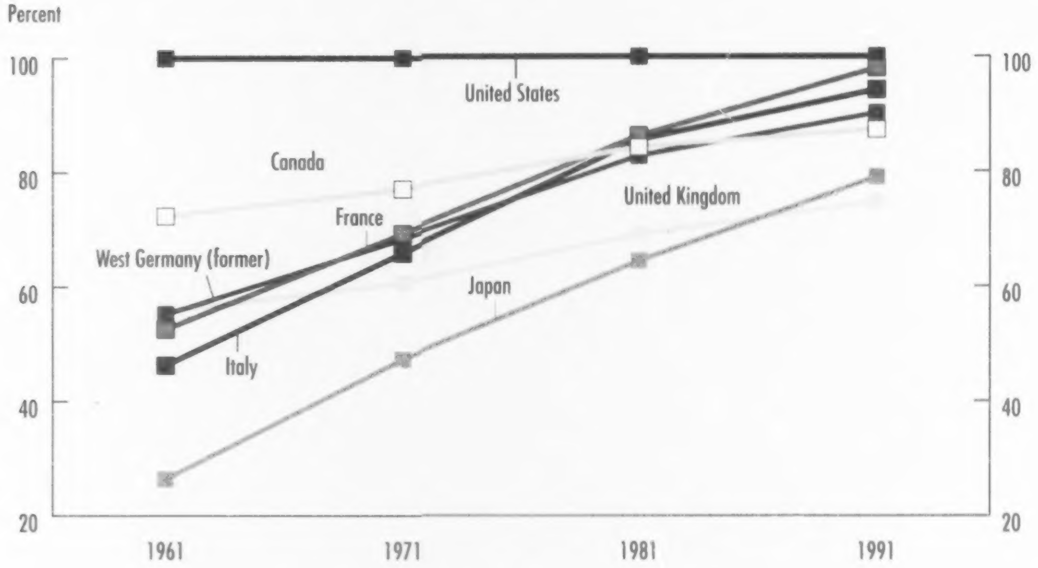
[2] All currencies converted to U.S. dollars at 1990 price levels using the Purchasing Power Parity (PPP) index. Consult the glossary for an explanation of the PPP index.

[3] Preliminary estimates.

[4] See supplemental note to Indicator 34 for the formula used to derive the average annual percentage increase in productivity between 1961 and 1991.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, *Comparative Real Gross Domestic Product Per Capita and Per Employed Person: Fourteen Countries 1960–91*, unpublished tables, February 1993, pp. 31–32, 37–38.

Figure 34: Productivity as a percentage of U.S. productivity,* by country: 1961–91



*Based on 1990 purchasing power parities (U.S. = 100).

SOURCE: U.S. Department of Labor, Office of Productivity and Technology, *Comparative Real Gross Domestic Product Per Capita and Per Employed Person, Fourteen Countries*, February 1993, p. 31.

Indicator 35: Children in Poverty

Poverty tends to limit children's developmental and educational opportunities; the higher the poverty rate, the greater the number of children who are damaged by poverty's insidious effects. This indicator provides a measure of the percentage of children living below the poverty line in industrialized countries most similar to the United States. For this indicator, the poverty line is set at 40 percent of adjusted median family income. The measure of children living below the poverty line, when combined with data about the impact of taxes and government transfers on income, suggests how effective government fiscal policies are at reducing income inequalities and poverty in a society.

- Before adjusting for taxes and transfers, the child poverty rate of both France and the United Kingdom approached or exceeded that of the United States (in various years between 1984 and 1986).
- The United States was the only country reported with double-digit child poverty rates (20.4 percent) after adjustment for taxes and transfers. The posttransfer poverty rates for children in the United States were between 2 and 10 times higher than those in the other countries with available data.
- Compared with children from all family backgrounds, a substantially larger percentage of those in single parent families lived in poverty, both pretransfer and posttransfer. Even after adjusting for taxes and transfers, one-half of U.S. children from single parent families and approximately one-third of those in Canada and Australia lived in poverty.

Table 35: Percentage of children (ages 17 or younger) whose family income is below 40 percent of adjusted median family income, by family status, tax and transfer status, and country: various years

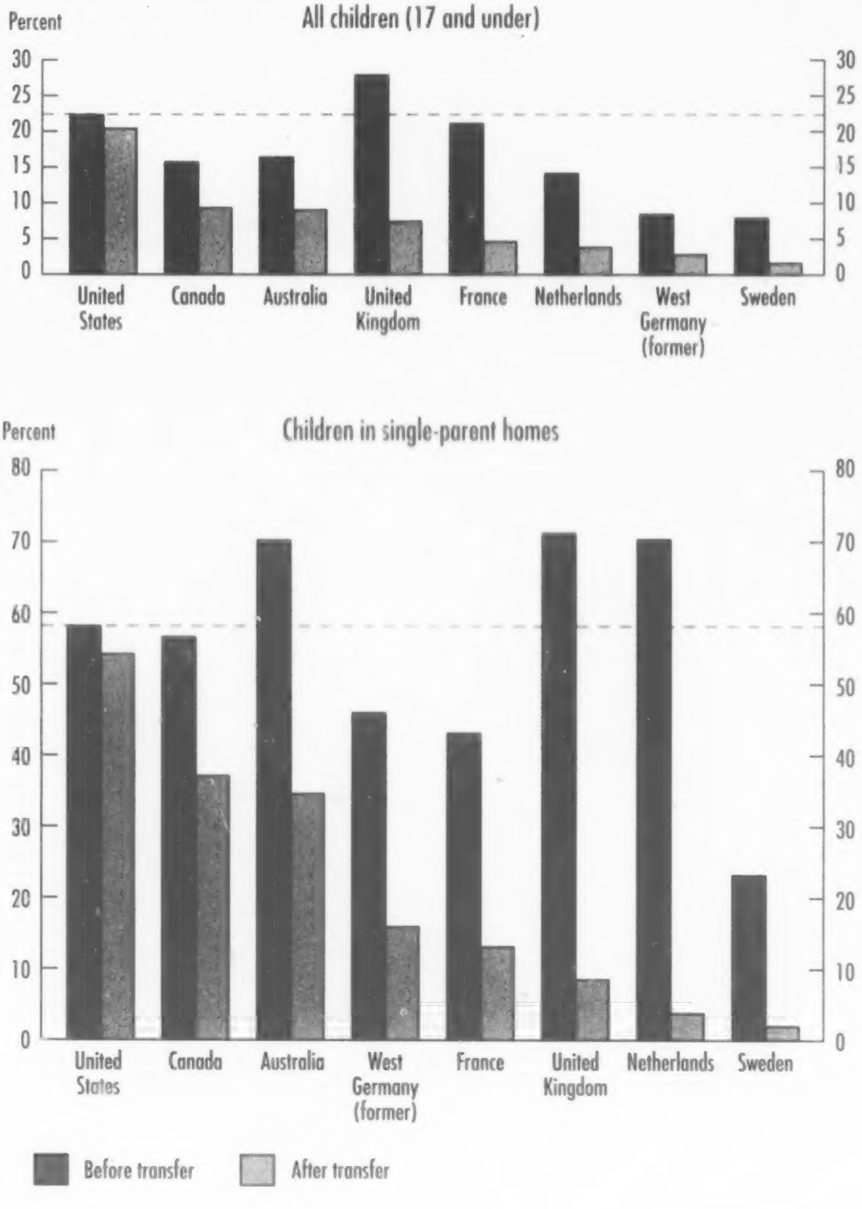
		All children		Children in single parent families	
Country	Year	Before transfer	After transfer	Before transfer	After transfer
G–7*					
Canada	1987	15.7	9.3	56.6	37.1
France	1984	21.1	4.6	43.1	13.1
West Germany (former)	1984	8.4	2.8	46.0	15.9
United Kingdom	1986	27.9	7.4	71.2	8.5
United States	**1986**	**22.3**	**20.4**	**58.1**	**54.2**
Other					
Australia	1985	16.4	9.0	70.2	34.6
Netherlands	1987	14.1	3.8	70.3	3.8
Sweden	1987	7.9	1.6	23.2	2.0

*No data available for Italy and Japan.

NOTE: Income includes all forms of income plus food stamps and similar benefits in other nations, minus federal income and payroll taxes. The resulting poverty rate differs slightly from the official U.S. poverty rate produced by the Bureau of the Census because it takes into account food stamps and the Earned Income Tax Credit. Income is adjusted using the U.S. Poverty Line Equivalence scale.

SOURCE: Luxembourg Income Study, published in Timothy Smeeding, "Why the U.S. antipoverty system doesn't work very well," *Challenge* (January–February, 1992): p. 33, table 3.

Figure 35: **Percentage of children in poverty, before and after tax and transfers, by country:* various years**



*Countries are sorted in descending order by percentage of children in poverty, after tax and transfers.

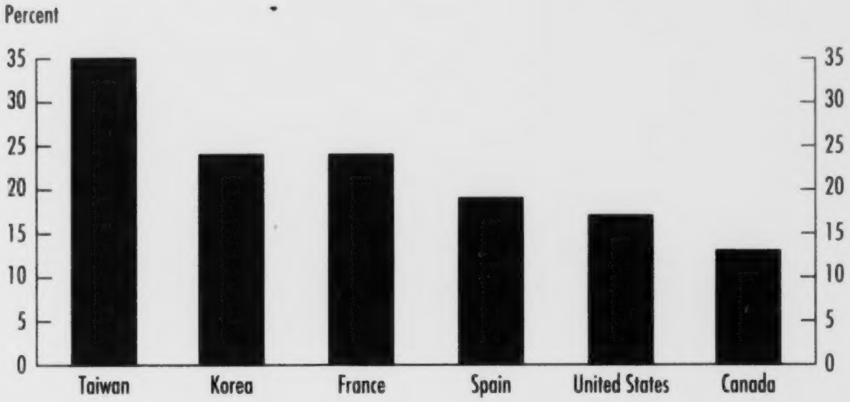
SOURCE: Luxembourg Income Study, published in Timothy Smeeding, "Why the U.S. antipoverty system doesn't work very well," *Challenge* (January–February, 1992): p. 33, Table 3.

Indicator 36: Books at Home

The number of books in the home is often an indicator of social and economic status. In addition, books provide children with opportunities for learning and intellectual growth. In a recent study of student achievement, the number of books in the home was positively associated with the geography, mathematics, and science achievement of 9- and 13-year-old students within a given country. However, this characteristic did not differentiate between high- and low-performing countries.

- Seventeen percent of 13-year-old students in the United States reported having fewer than 25 books in their home in 1991. In only two other countries (Israel and Hungary) did a smaller percentage of students report having fewer than 25 books at home, while a higher percentage of students reported having fewer than 25 books at home in six other countries (France, Ireland, Japan, Korea, Scotland, and Taiwan). The remaining countries reported percentages similar to that of the United States.
- The percentage of students reporting fewer than 25 books at home varied greatly across the countries reported, ranging from 10 percent in Hungary and Israel to 51 percent in Jordan.

Figure 36: Percentage of students with fewer than 25 books in their home, by selected country: 1991



SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992.

Table 36: Percentage of 13-year-old students who reported having fewer than 25 books in their home, by country: 1991

Country	Total[1]
G–7[2]	
Canada	13 (0.8)
France	24 (1.3)
United States	**17 (1.3)**
Other	
Hungary	10 (1.0)
Ireland	24 (1.6)
Israel	10 (0.8)
Jordan	51 (1.7)
Korea	24 (1.2)
Scotland	26 (1.7)
Slovenia	19 (1.0)
Soviet Union (former)	12 (1.8)
Spain	19 (1.2)
Switzerland	16 (1.1)
Taiwan	35 (1.2)

[1] Jackknifed standard errors are in parentheses.

[2] No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: Only countries in which comprehensive student populations were represented by the survey samples are included. Questionnaire administrations in Brazil, China, England, and Portugal either excluded groups or had participation rates below 70 percent. See supplemental note to Indicator 36 for details on indicator calculation for Canada, Israel, Scotland, the former Soviet Union, Spain, Switzerland, and the United States.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992.

Indicator 37: Homework Assistance

The percentage of 13-year-old students who receive assistance at home with their mathematics and science homework reflects assumptions held by parents concerning their role in their children's academic work. However, researchers have not conclusively demonstrated the relationship between assistance at home and student achievement. Home assistance may serve a remedial function, since children who are doing less well in school tend to receive greater amounts of help. This indicator is also influenced by the amount of time parents can devote to homework assistance and by parental attitudes in each country about the contribution they can make to their children's education.

- In 1991, more 13-year-olds in the United States received help at home with both their mathematics (74 percent) and science (53 percent) homework than did their counterparts in almost all of the other countries reported. Exceptions included Hungary, where more students received help at home in both subject areas; Spain, where more students received help at home with science homework; and Canada, where similar percentages received help at home with both their mathematics (59 percent) and science (47 percent) homework.
- The percentage of 13-year-old students who received help with homework at home varied considerably from country to country, ranging from 26 percent who received help with science homework (in the former Soviet Union and Switzerland) to 80 percent who received help with mathematics homework (in Hungary).
- More 13-year-old students received help with mathematics than with science homework in the United States and in every other country reported with the exception of Spain, Jordan, and Slovenia.*

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*The differences between mathematics and science for Jordan and Slovenia are not statistically significant.

Table 37: Percentage of 13-year-old students who receive help at home with homework, by subject area and country: 1991[1]

Country	Mathematics	Science
G–7[2]		
Canada	69 (1.1)	47 (1.0)
France	53 (1.0)	44 (1.5)
United States	**74 (1.4)**	**53 (1.8)**
Other		
Hungary	80 (1.0)	61 (1.5)
Ireland	61 (1.4)	44 (1.9)
Israel	53 (1.4)	31 (1.3)
Jordan	43 (1.3)	40 (1.7)
Korea	53 (1.4)	44 (1.1)
Scotland	65 (1.7)	47 (1.6)
Slovenia	62 (1.5)	59 (1.7)
Soviet Union (former)	32 (1.3)	26 (1.0)
Spain	58 (1.5)	61 (1.5)
Switzerland	42 (1.3)	26 (1.4)
Taiwan	51 (1.1)	45 (1.1)

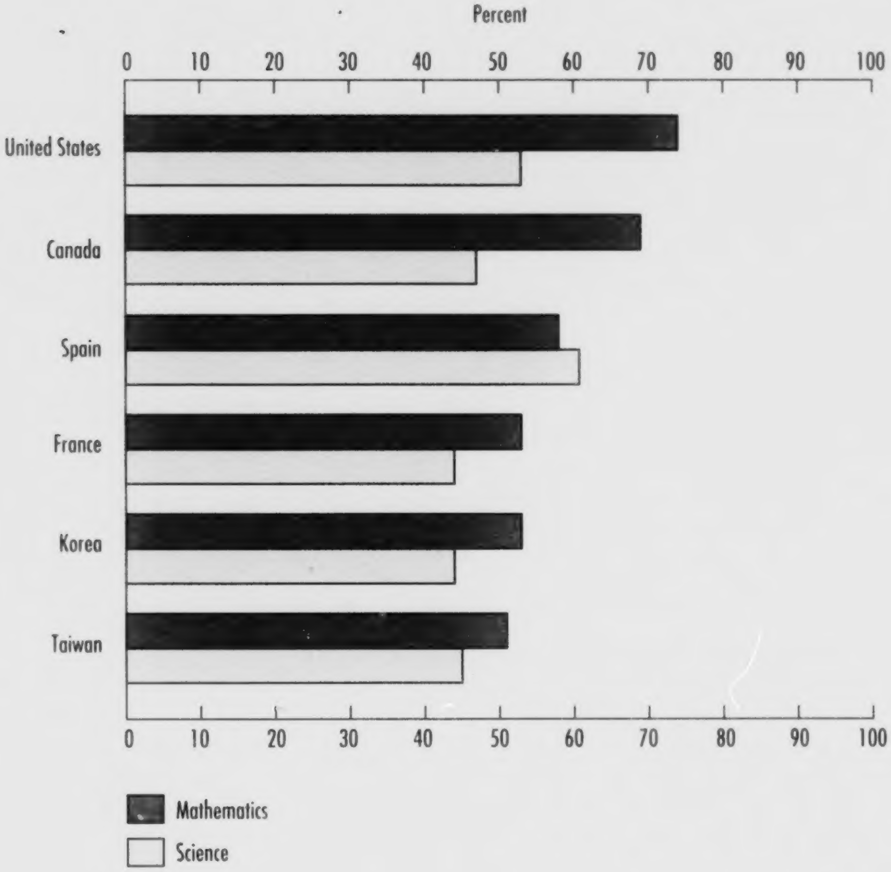
[1] Jackknifed standard errors are presented in parentheses.

[2] No data available for Germany, Italy, Japan, and the United Kingdom.

NOTE: Only countries in which comprehensive student populations were represented by the survey samples are included. Questionnaire administrations in Brazil, China, England, and Portugal either excluded groups or had participation rates below 70 percent. See supplemental note to Indicator 37 for details on indicator calculation for Canada, Israel, Scotland, the former Soviet Union, Spain, Switzerland, and the United States.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992; *Learning Science*, 1992.

Figure 37: **Percentage of 13-year-old students who receive help at home with mathematics or science homework, by selected country:[*] 1991**



[*] Countries are sorted in descending order by percentage of students receiving home assistance with mathematics homework.

SOURCE: Educational Testing Service, International Assessment of Educational Progress, *Learning Mathematics*, 1992; *Learning Science*, 1992.

SOCIETAL SUPPORT FOR EDUCATION

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SOCIETAL SUPPORT FOR EDUCATION

The indicators in this section explore U.S. investment in the human and financial resources of education and compare this investment with that of other industrialized countries. Overall, the United States appears supportive of education. To illustrate, in public and private education, the United States has a student/teacher ratio similar to the ratios of all the countries reported (Indicator 39). Additionally, the public financial investment in education in the United States is among the highest of the G–7 countries, and of many of the other countries reported as well (Indicators 41 and 42).

When considering spending on education, it is important to note that not all countries' education systems provide the same services. Countries have different priorities for education spending and may allocate more or less money to such educational services as special education, in-school libraries, and psychological counseling, among others.

Public financial investment in education

To illustrate, the U.S. devoted a greater share of public expenditure to education than all of the G–7 countries except Canada (Indicator 41). Further, relative to GDP per capita, the United States is among the highest spenders of the G–7 countries (Indicator 42). Finally, the United States outspent all of the G–7 countries except Canada on a measure of per student expenditure on primary and secondary education in constant U.S. dollars. However, relative to GDP per capita, U.S. per student expenditures are in the middle range for G–7 countries (Indicator 43). As with most G–7 countries, in 1992 the United States devoted approximately three-fourths of its current public expenditure to preprimary through high school education and the remaining share to higher education (Indicator 44).

In the United States, most public funding for primary through secondary education originated at the regional (state) or local levels in 1992, while in France and Italy, most originated at the central level (Indicator 45). Public expenditure does not provide the entire picture of educational spending. Private expenditure is an important component of education financing in some countries, including the United States, that is not considered in indicators of public investment. Private expenditure can make up 20 percent or more of total educational spending in such countries as Germany, Japan, Spain, and the United States. It becomes even more important at the higher education level, where it makes up more than 40 percent of the total educational expenditure in the United States and over 55 percent in Japan. (See the sidebar entitled *Private spending plays a role in education financing.*)

Cross-country comparisons of financial statistics have often been criticized for the comparability problems in the data. However, the indicators in this section benefit from recent improvements in comparability, particularly in the public sector.

Teacher salaries

Teacher salaries are the largest component of educational cost in any country. While the indicators described previously highlight the extent of U.S. investment in education, its spending on teachers lags behind many industrialized nations. To illustrate, high school teachers in the United States have lower salaries relative to GDP per capita than their counterparts in all the G–7 countries except Japan (Indicator 40). The comparatively low pay of U.S. teachers is not consistent with the high K–12 spending in the United States.

One reason for the lower teacher salaries in the United States compared with the other countries reported may be that U.S. teachers (especially high school teachers) are required to obtain less training than their counterparts in the other G–7 countries. Whereas the United States offers a year to year teacher training program, the other G–7 countries often require 5 or more years of training. (See the matrix entitled *Elementary and secondary school teacher training and certification requirements.*)

Staff employed in education

The United States also differs in the composition of its staff employed in education (Indicator 38). While the United States has a similar amount of teaching staff as a percentage of the total labor force as do all of the G–7 countries for which data are available except Italy, this percentage was lower in the former West Germany, Japan, the United Kingdom, and the United States than in all of the remaining countries, except for the Netherlands and Turkey. Additionally, the United States was the only country where nonteaching staff made up a greater percentage of the labor force than teaching staff.

However, in the United States, support for education goes beyond providing for instruction. The education system in the United States offers services (e.g., meals, transportation) that are not necessarily provided by schools in other countries. In Australia, for instance, the education system does not employ nurses or doctors for most of its elementary and secondary schools. Instead, students rely on other sources for health care. (See the sidebar entitled *Staffing a country's education system.*)

Indicator 38: Staff Employed in Education

The percentage of the labor force employed in a country's education system provides a measure of the size of the education system as an employer in relation to other sectors of the economy. A high percentage of the labor force employed in education reflects an extensive education system with a wide range of personnel to support it. However, the indicator is also highly dependent on the number of employees in other sectors of the economy, which may fluctuate with trends in the labor market. Comparing the relative sizes of the teaching and nonteaching staff employed in education is also useful as an indicator of the level of administrative, social service, maintenance, and nonteaching instructional support provided by the education system. For a more detailed discussion of the issues associated with the composition of staff employed in education, see the sidebar entitled *Staffing a country's education system*.

- In the United States, teaching staff comprised 2.7 percent of the total labor force in 1992. Of the G–7 countries, the former West Germany, Japan, and the United Kingdom had similar shares of teaching staff as a percentage of the total labor force (more than 2 percent). The teaching staff in Italy comprised a greater proportion of the labor force (4.2 percent).
- The percentage of teaching staff in the labor force was lower in the former West Germany, Japan, the United Kingdom, and the United States than in all of the remaining countries, except for the Netherlands and Turkey.
- In all of the countries reported, the percentage of the labor force employed as teaching staff in primary and secondary schools was larger than the percentage of the labor force employed as teaching staff in higher education. To illustrate, the percentage for primary and secondary education was four times the percentage for higher education in the United States. In the former West Germany, the primary and secondary teaching staff was almost three times as large as the teaching staff in higher education, while in the United Kingdom it was seven times as large.
- Of the eight countries for which data were available, the United States had the largest nonteaching staff in education as a percentage of the total labor force (3.1 percent) and also was the only country in which nonteaching staff made up a greater percentage of the labor force than teaching staff.

Table 38: Teaching staff and nonteaching staff employed in the education system as percentages of the total labor force,[1] by level of education and country: 1992

Country	Teaching staff			Nonteaching staff		All education staff
	Primary and secondary	Higher education	All levels[2]	Pedagogical staff[3]	Support staff[4]	
G–7[5]						
France	2.4	0.4	3.3	—	—	5.5
West Germany (former)	1.6	0.6	2.4	—	—	—
Italy	3.5	0.1	4.2	0.4	0.8	5.5
Japan	1.7	0.4	2.4	(6)	0.7	3.1
United Kingdom	2.2	0.3	2.5	—	—	—
United States[7]	**2.2**	**0.5**	**2.7**	**0.8**	**2.3**	**5.8**
Other						
Australia	2.3	0.6	2.9	0.3	1.2	4.2
Austria	3.0	0.5	3.8	—	—	—
Belgium	3.8	0.3	4.8	0.6	0.6	6.0
Czech Republic	2.4	0.3	3.5	0.7	0.0	4.2
Denmark	2.7	0.2	3.3	1.6	0.9	5.7
Finland	—	—	3.1	—	—	5.1
Hungary	3.0	0.4	4.2	(6)	2.2	6.4
Ireland	2.8	0.4	3.6	—	—	—
Netherlands	1.8	0.4	2.4	—	—	—
New Zealand	2.3	0.5	3.3	—	—	—
Spain	2.6	0.4	3.3	—	—	—
Sweden	2.3	—	—	—	—	—
Turkey	2.0	0.2	2.2	—	—	—

—Not available.

[1] Full-time equivalents.

[2] Includes preprimary education.

[3] Pedagogical staff include principals, headmasters, supervisors, counselors, psychologists, librarians, etc.

[4] Support staff include clerical personnel, building operations and maintenance personnel, food service workers, etc.

[5] No data available for Canada.

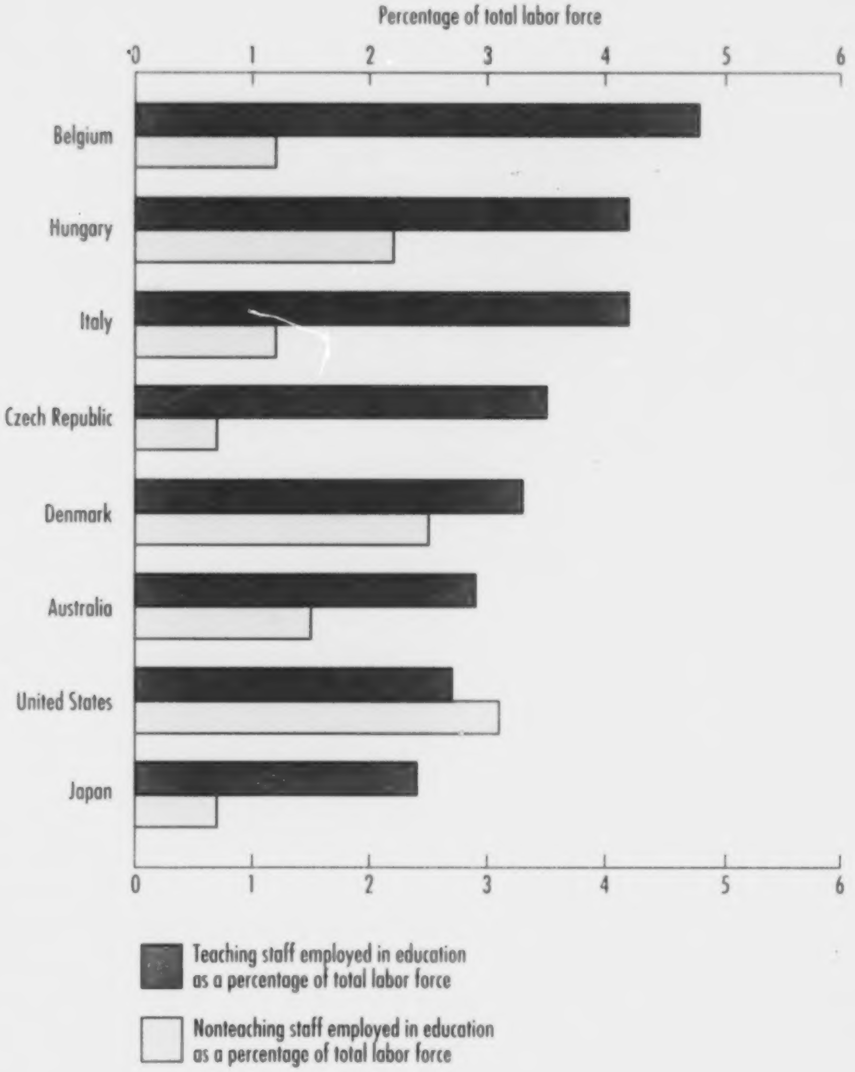
[6] Data included in another category.

[7] U.S. submissions to the Organization for Economic Co-operation and Development, March, 1996.

NOTE: See supplemental note to Indicator 38 for details on indicator calculation for Australia, Denmark, Japan, the United Kingdom, the United States, and the former West Germany and for an explanation of the calculation of full-time equivalents.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 38: Teaching and nonteaching staff employed in education as a percentage of the labor force, by selected country:* 1992



*Countries are sorted in descending order by teaching staff as a percentage of the total labor force.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Staffing a country's education system[1]

Staff are a crucial component of a country's education system, and staff employed in education as a percentage of the total labor force is one measure of a country's commitment to educating its populace. Indicator 38 explores this issue and focuses on the composition of education system staff, specifically, the share of teaching and nonteaching staff. The relative shares of both vary widely across countries. This variation arises both from fundamental differences in the nature of schools, particularly the services provided to students, and from differences in who are counted as teachers.

The composition of staff employed in education will vary widely across countries because not all countries provide the same types of services to their students through the education system. At the elementary and secondary levels, schools and school districts in the United States typically provide transportation to and from schools for at least some students, maintain a school cafeteria and offer subsidized meals, have a variety of school-based noneducation services such as health care and counseling, and offer a wide range of extracurricular activities. In other countries, although these services and activities may be available to students, they are not necessarily provided by the education system. For example, in many OECD countries,[2] schools do not have cafeterias or other types of meal services. Subsidized transportation may be available to students, but through public transportation authorities. Similarly, in many countries, such as Australia, most elementary and secondary schools do not employ health professionals. Although they have a close working relationship with the schools, employers of health professionals may be either private- or public-sector organizations or agencies. In Germany, students receive vocational counseling, but it is provided by the Federal Labor Ministry. In addition, elementary schools in other OECD countries are less likely to employ specialized personnel such as librarians and media specialists than U.S. elementary schools. Thus, the type and extent of such services offered by the education system have a major influence on differences in the composition of primary and secondary education staff between countries.

Similar differences in the range of services available to students exist at the postsecondary level as well. Many colleges and universities in the United States operate as centralized campuses and exist as communities in and of themselves. They offer housing, meals, and comprehensive counseling and health services and maintain extensive physical facilities. In 1989, instruction and research faculty and assistants comprised approximately 40 percent of all employees of U.S. institutions of higher education.[3]

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[1] Except where noted, this sidebar is based on S.M. Barro, "*Preliminary findings from the Expenditures Comparability Study*" (Washington, D.C.: SMB Economic Research, Inc., 1993).

[2] See the *Glossary* for a list of the member nations of the Organization for Economic Co-operation and Development (OECD).

[3] U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993* (Washington, D.C.: 1993), 224.

Because universities and colleges in other countries may be less likely to offer the wide range of services provided by many U.S. colleges and universities, the ratio of teaching to nonteaching staff will often be larger in other countries than in the United States. In Spain, for instance, because most students live at home while attending university, student dormitories are nowhere near as common as they are in the United States. In Germany as well, students tend to live off campus. A federally funded organization, the *Studentenwerk*, oversees student housing, meal services, and financial aid.[4] However, none of these services are as extensive as in the United States. The Studentenwerk has established subsidized housing for approximately 10 percent of the university population; and, since coursework is free at German universities, student financial aid—provided through the Studentenwerk in the form of interest-free loans—is needed only to assist with living expenses. Differences in staff composition reflect differences in the degree of noneducational services provided by universities.

Much of the variation in the composition of education system staff also reflects differences in how personnel are classified across countries. What factors underlie these differences in classification? One major difference across countries is in the definition of teaching personnel. The United States includes only classroom teachers in this category. In contrast, many other countries, including Australia, Austria, Germany, France, and the United Kingdom, also include personnel involved in the administration of schools. In the case of assistant principals or other administrative personnel who have some teaching responsibilities, this practice yields results somewhat comparable to the U.S. data. The accuracy of comparisons with the United States is compromised when these countries include administrative staff with no teaching responsibilities. It is unclear exactly which nonteaching administrative personnel are classified as teaching staff in those countries that have adopted this approach; but many countries include principals and headmasters, and some may even include counselors, psychologists, and persons who are certified as teachers but work in central offices.

In comparing the relative sizes of teaching and nonteaching staff, there is a natural tendency to draw conclusions about the priority or emphasis of education systems. However, these conclusions must be tempered with the consideration that: (1) services provided by education systems in some countries may be provided by other agencies or authorities in other countries; and (2) education systems classify their personnel differently.

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[4] G. Porter, *World Education Series: Federal Republic of Germany*, American Association of Collegiate Registrars and Admissions Officers, "Federal Republic of Germany," *World Education Series* (Washington, D.C.: 1986), 60–61

Indicator 39: Student/Teacher Ratio

The student/teacher ratio measures the number of students per teacher. It reflects teacher workload and the availability of teachers' services to their students. The lower the student/teacher ratio, the higher the availability of teacher services to students. The student/teacher ratio has implications not only for the cost of education, but also for the quality. The student/teacher ratio is not the same as class size, however. (See Indicator 21 for a discussion of class size.) The relationship between these two measures of teacher workload is affected by a variety of factors, including the number of classes for which a teacher is responsible and the number of classes taken by students.

Although Indicator 39 provides student/teacher ratios both for public education and for public and private education combined, the general pattern of cross-country variation and cross-education-level variation in student/teacher ratios for these two sectors is similar. Discussions, therefore, focus on public education.

- Of the G–7 countries for which 1992 data were available, Italy had the lowest student/teacher ratio at all levels of education while the United States had among the highest in all but primary education.*
- Except in Hungary, Sweden, and the United States, student/teacher ratios for public secondary education (lower and upper combined) were lower (at least slightly) than the ratios for public primary education.
- Student/teacher ratios varied greatly among the countries reported. For public schools at the primary level, they ranged from 10.5 in Italy to 29.4 in Turkey (in 1991, the ratio for the United States was 15.5); and at the upper secondary level, they varied from 8.2 in Norway to 19.8 in the former West Germany (the ratio for the United States was 15.6).
- Including the data for public and private sectors of education in the same indicator had no appreciable effect on student/teacher ratios in most countries, including the United States. However, in some countries student/teacher ratios increased, while in other countries they decreased, when public and private education were combined. For example, at the primary level in Spain, the student/teacher ratio increased from 18.8 for public education to 21.2 for public and private education combined.

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*For further information on the levels of education, see the sidebar entitled *ISCED levels of education*.

Table 39: Ratio of students to teaching staff,[1] by level of education and country: 1992

Country	Public education					Public and private education				
	Pre-primary	Primary	Lower secondary	Upper secondary	All secondary	Pre-primary	Primary	Lower secondary	Upper secondary	All secondary
G–7[2]										
France	25.8	20.2	—	—	14.0	26.0	20.4	—	—	14.3
West Germany (former)	24.4	19.6	14.6	19.8	16.4	23.9	19.6	14.6	19.0	16.2
Japan	14.5	19.8	17.0	15.5	16.3	18.5	19.8	16.8	16.4	16.6
Italy	11.8	10.5	8.9	9.1	9.0	13.3	10.9	9.0	8.8	8.9
United Kingdom	38.1	21.2	16.5	14.9	15.5	38.1	20.8	15.9	14.8	15.2
United States	**—**	**15.5**[3]	**17.7**	**15.6**	**16.7**	**—**	**15.2**[3]	**16.8**	**15.0**	**15.9**
Other										
Australia	—	18.0	—	—	12.8	—	18.4	—	—	12.9
Austria	17.3	12.2	7.9	11.4	9.4	18.3	12.2	7.7	11.6	9.4
Belgium	17.5	13.0	—	—	6.7	18.4	13.7	—	—	7.8
Czech Republic	10.9	22.9	17.0	10.6	13.3	10.9	22.9	17.0	10.5	13.2
Denmark	10.8	11.1	9.0	10.4	9.6	10.7	10.9	9.1	10.4	9.7
Finland	—	—	—	—	—	12.5	19.0	—	—	—
Hungary	11.3	12.6	11.5	14.1	12.7	11.5	12.7	11.6	14.1	12.7
Ireland	27.5	25.8	—	—	17.1	27.2	25.6	—	—	17.1
Netherlands	—	—	—	—	—	25.9	23.6	—	—	18.8
New Zealand	17.0	18.5	—	—	18.0	8.8	18.5	—	—	17.7
Norway	—	10.6	8.5	8.2	8.3	—	—	—	—	—
Spain	21.5	18.8	16.6	14.5	15.3	23.4	21.2	17.6	15.9	16.6
Sweden	—	11.9	10.4	16.0	12.8	—	11.9	10.6	16.0	13.0
Turkey	16.7	29.4	46.3	13.6	23.7	16.6	29.3	47.5	13.2	23.4

—Not available.

[1] Students and teaching staff are full-time equivalents.

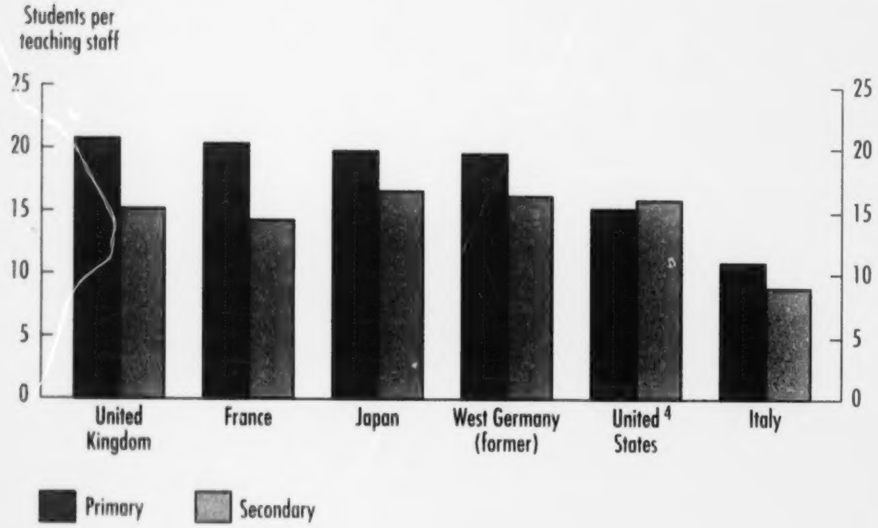
[2] No data available for Canada.

[3] 1991 data.

NOTE: See supplemental note to Indicator 39 for an explanation of the calculation of full-time equivalents.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 39: Ratio of students to teaching staff, by level of education and G–7 country:[1,2,3] 1992



[1] No data available for Canada.

[2] Public and private education combined.

[3] Countries are sorted in descending order by the ratio of students to teaching staff in primary education.

[4] Primary level, 1991 data.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 40: Teacher Salaries

Teacher salaries are a measure of teachers' standard of living and reflect what society is willing to pay for the direct work of education. Expressed in units of a common currency, they reflect the cost of teachers in an *absolute* sense, irrespective of a nation's wealth and the resources it can devote to teaching.* Teacher salaries relative to GDP per capita allow for comparisons among countries with wide income disparities. A simple index is created by dividing a teacher salary figure by a country's GDP per capita and multiplying by 100. If the index equals 100, a teacher is paid the same as the per capita GDP. Expressed in this manner, the indicator examines what each country spends on its teachers *relative* to its ability to pay for their services. For example, a poor country with lower teacher salaries than those of other nations may actually be devoting a larger share of its available resources to teachers than wealthier countries.

- At both starting and maximum salary levels, primary and lower secondary school teachers in the United States had among the highest average salaries of all countries for which data were available when salaries were viewed in absolute terms (in constant U.S. dollars). To illustrate, the 1992 average salary of the primary school teachers at the maximum salary level was higher in the United States than it was in all of the countries reported except Japan, Austria, and Portugal. At the lower secondary level, the starting salaries of U.S. teachers were among the highest in absolute terms, at $21,787, along with those of teachers from Spain ($22,964) and Germany ($27,444).
- However, U.S. primary and lower secondary school teachers did not fare as well when the salary was viewed relative to GDP per capita. All of the G–7 countries with available data equaled or exceeded the United States on this measure (at both starting and maximum salary levels), as did most of the remaining countries.
- The ratio of teacher salary to per capita GDP varied considerably across the countries presented. To illustrate, the ratio of starting salary for primary school teachers to per capita GDP ranged from 84 in Sweden to 188 in Turkey.

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*The statement is accurate as long as currencies are converted using purchasing power parity (PPP) rates rather than market exchange rates. PPP rates isolate the current, relative domestic purchasing powers of different currencies and are the rates used to convert the figures presented here.

Table 40a: Teacher salaries in U.S. dollars,[1] by education level, career point, and country: 1992

	Primary		Lower secondary	
Country	**Starting**	**Maximum**	**Starting**	**Maximum**
G–7[2]				
Germany	$23,627	$32,464	$27,444	$36,119
Italy	18,161	27,852	19,708	30,927
Japan[3]	17,700	43,300	17,700	43,300
United Kingdom (England & Wales)	16,551	34,081	16,551	39,259
United States	**21,240**	**35,394**	**21,787**	**37,146**
Other				
Austria	17,309	38,962	18,415	42,448
Belgium	17,531	28,582	17,955	31,308
Finland	17,481	22,046	20,033	25,677
Ireland	17,748	32,624	17,748	32,624
Netherlands	16,819	30,969	16,855	33,454
New Zealand	14,289	20,882	15,108	21,950
Norway	17,436	21,336	17,436	21,336
Portugal	13,784	36,078	13,784	36,078
Spain	22,964	30,632	22,964	30,632
Sweden	13,999	18,099	15,699	19,698
Turkey	6,994	12,409	7,053	12,409

[1] Teacher salaries were converted to U.S. dollars using purchasing power parities (PPPs).

[2] No data available for Canada and France.

[3] 1991 data.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Table 40b: Ratio of teacher salary to per capita GDP,[1] by education level, career point, and country: 1992

Country	Primary		Lower secondary	
	Starting	Maximum	Starting	Maximum
G-7[2]				
Germany	116	159	134	177
Italy	104	159	113	177
Japan[3]	93	228	93	228
United Kingdom (England & Wales)	101	209	101	240
United States	**91**	**152**	**94**	**160**
Other				
Austria	96	215	102	235
Belgium	96	157	99	172
Finland	120	152	139	177
Ireland	143	263	143	263
Netherlands	99	182	99	197
New Zealand	99	145	105	152
Norway	98	120	98	120
Portugal	141	369	141	369
Sweden	84	109	95	119
Spain	179	238	179	238
Turkey	188	333	189	333

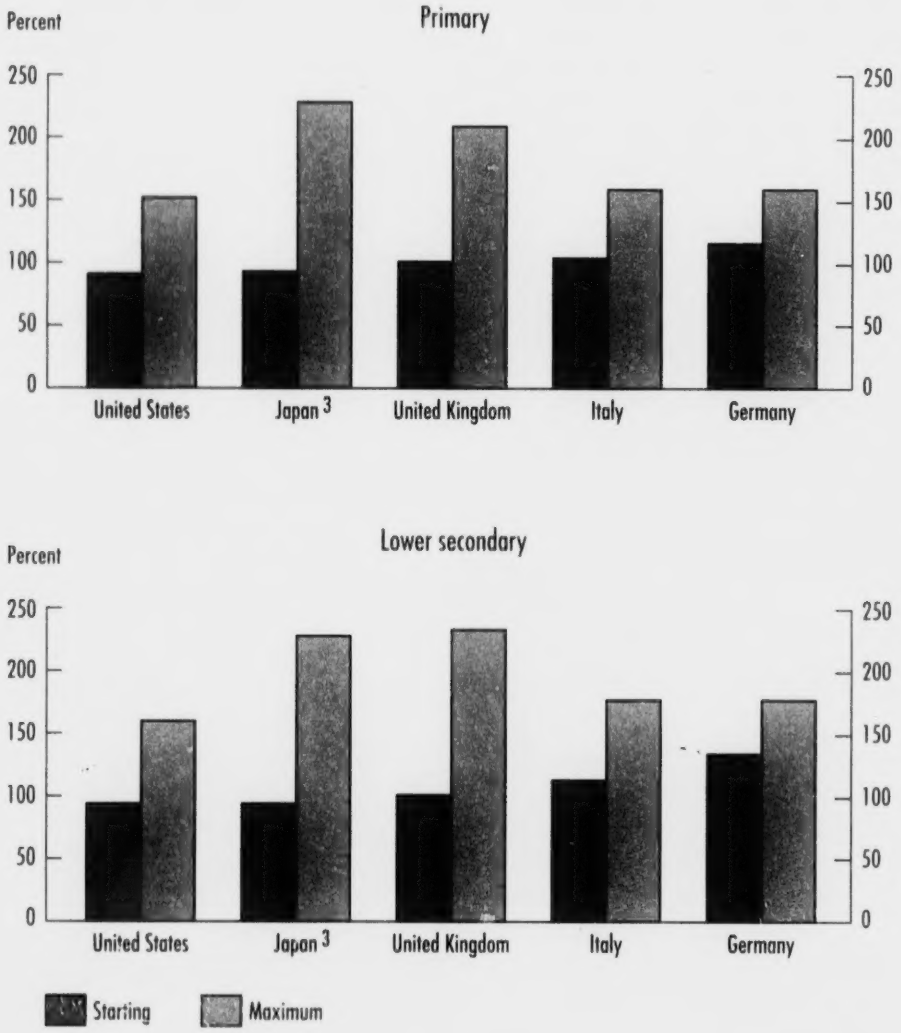
[1] The ratio of teacher salary to per capita GDP was computed by dividing the teacher salary figure by the GDP per capita and multiplying by 100.

[2] No data available for Canada and France.

[3] 1991 data.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 40: Ratio of teacher salary to GDP per capita, by education level, career point, and G–7 country:[1,2] 1992



[1] No data available for Canada and France.

[2] Countries are sorted in ascending order by ratio of primary teachers' starting salary to GDP per capita.

[3] 1991 data.

NOTE: A value of 100 indicates that teachers are paid the same as GDP per capita.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation International Indicators Project, 1995.

Teacher salaries are not a clear-cut marker of teacher compensation*

Education policymakers are concerned with teacher salaries because they are the single largest component of educational costs in a country's education system; they have been directly linked to recruitment and retention of teachers, and they have been indirectly linked to teacher quality. Issues of comparability associated with teacher compensation and the teaching environment influence international comparisons of teacher salaries, however. For instance, the structure and makeup of compensation and benefits packages can differ dramatically from country to country. Some countries rely heavily on forms of cash compensation other than basic salary, such as bonuses. Others have fringe benefits that differ substantially in scope from those in the United States. In addition, the share of gross teacher salary earmarked for retirement and health care varies—often substantially—across countries. U.S. teachers, for instance, contribute between 13 and 21 percent of their gross salary to state retirement funds, national social security, and health care premiums—substantially more than teachers in other countries. Swedish teachers, on the other hand, have no paycheck deductions for retirement or national social security. As much as possible, Indicator 40 includes the bonuses, stipends, supplements, and overtime pay generally received by teachers; but it excludes fringe benefits and employer-paid contributions to pension funds and national social security.

International teacher salary comparisons can be further affected by intercountry variations in working conditions and job characteristics. Countries in which teachers receive virtually identical salaries may not, in fact, be receiving the same services in return or be providing teachers with the same opportunities. Teachers who face more demanding teaching conditions (e.g., larger number of instructional hours, heavier class loads) presumably require higher compensation to remain equally satisfied with their jobs. However, data about the larger context surrounding teaching are not available.

International teacher salary comparisons are also affected by definitional differences that affect most, if not all, international education comparisons. For instance, some categories of teaching staff have no equivalent U.S. counterparts. To illustrate, the French education system, for example, utilizes at least nine categories of teaching personnel beyond the traditional U.S. categories of primary, elementary, and secondary education. It is not always clear which categories are included in an indicator and how they are treated.

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[*] The primary sources for this sidebar include: American Federation of Teachers, *How U.S. Teachers Measure Up Internationally: A Comparative Study of Teacher Pay, Training, and Conditions of Service* (Washington, D.C.: July, 1993); and U.S. Department of Education, National Center for Education Statistics, "International Comparisons of Teachers' Salaries: An Exploratory Study," (Washington, D.C.: July, 1988).

Indicator 41: Current Public Expenditure on Education as a Percentage of Total Public Expenditure

The magnitude of each country's current* public expenditure on education as a percentage of the government's total public expenditure is a rough indicator of the relative importance accorded to education among each country's public sector activities. Some of the variation in the share of total public spending allocated to education reflects differences among countries in the division of responsibility for financing education between the public and private sector. In most countries, public revenues provide virtually all the money spent on education. Exceptions include countries such as the United States and Japan, where 20 to 25 percent of educational funding comes from private sources. The indicator is also affected by the total amount of public expenditure, such as public expenditures for defense or social benefits. Differences among countries in the distribution of educational expenditures by education level reflect differences in national educational goals and strategies. For example, some countries are more likely to make early childhood education widely available and inexpensive, while others devote relatively more resources to higher education.

- In 1992, the United States and Canada devoted a greater share of their public expenditure to education (around 13 percent) than any of the other G–7 countries. In the remaining G–7 countries, the corresponding percentages ranged from 6 percent (former West Germany) to 11 percent (United Kingdom). Among all of the countries reported, Hungary spent the highest share of its public expenditure on education (11 percent).
- The share of public funds devoted to higher education varied a great deal among the G–7 countries, as it did among the other countries reported. Of the G–7 countries, the United States and Canada distributed the highest percentages of total public expenditure to higher education (3 and 5 percent, respectively), while Japan distributed the lowest (under 1 percent).
- None of the G–7 countries devoted a larger share of their public budget to primary and secondary school education than did the United States (9 percent). In all countries with available data, the share of public expenditure devoted to preprimary through secondary education ranged from 4 percent in the former West Germany to 11 percent in Hungary and Switzerland.

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*Current expenditures are operating expenditures that are used each year for the operation of schools. They do not include capital expenditure used for providing school plant and facilities or debt service.

Table 41: Current public expenditure on education as a percentage of total public expenditure, by level of education and country: 1992

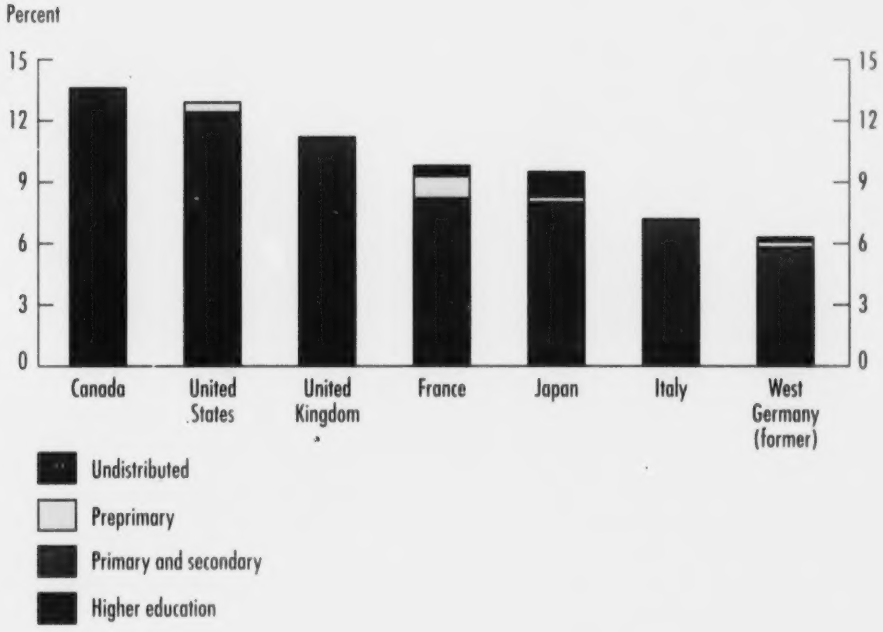
Country	Preprimary	Primary and Secondary	Higher education	Undistributed/ other	Total
G–7					
Canada	—	8.5	5.1	—	13.6
France	1.1	6.6	1.6	0.5	9.7
West Germany (former)	0.3	4.1	1.7	0.2	6.3
Italy	—	6.1	1.1	—	7.2
Japan	0.3	7.2	0.8	1.2	9.6
United Kingdom	—	8.9	2.3	—	11.2
United States	**0.5**	**9.2**	**3.2**	**—**	**12.9**
Other					
Australia	0.1	7.8	3.9	—	11.9
Austria	—	6.4	1.9	—	8.3
Belgium	—	5.9	1.5	—	7.4
Czech Republic	—	8.5	2.0	—	10.5
Denmark	1.5	6.7	1.8	0.2	10.2
Finland	1.1	7.5	3.0	1.0	12.6
Hungary	2.2	11.1	3.8	0.3	17.4
Netherlands	0.5	4.9	2.3	0.4	8.1
Norway	1.3	8.7	2.2	0.7	13.0
Sweden	1.6	6.9	1.5	—	10.1
Switzerland	1.7	11.0	2.8	—	13.8

—Not applicable or available.

NOTE: See supplemental note to Indicator 41 for details on indicator calculation for Australia, Belgium, Canada, the Czech Republic, Denmark, Finland, the former West Germany, Italy, Norway, Sweden, Switzerland, and the United Kingdom and for information regarding methodology used for adjusting inflation rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 41: Current public expenditure on education as a percentage of total public expenditure, by education level and G–7 country:* 1992



*Countries are sorted in descending order by total current public expenditure on education as a percentage of total public expenditure.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Private spending plays a role in education financing[*]

Indicators 41, 42, and 43 provide measures of public investment in education. However, measures of public investment do not give a complete picture of a country's financial investment in education since many countries have a substantial private investment as well. Though the amount of *private* expenditure on public and private schools is negligible in some countries, it can account for 20 percent or more of total educational spending in such countries as Germany, Japan, Spain, and the United States. Expenditure from private sources is especially important at the higher education level, where it makes up more than 40 percent of the total educational expenditure in the United States, over 55 percent in Japan, and around 20 percent in Spain and Australia.

Private spending on education takes several different forms: student tuition or fees; direct or in-kind contributions; and direct private provision of education. The following paragraphs describe these methods of private spending on education.

The greatest amount of private spending occurs at the higher education level, and student tuition and fees account for most of the private spending on education at this level in such countries as the United States, Japan, and Spain. Generally, though, one finds some private spending on education in most countries even in public elementary and secondary schools. Families may pay for their children's school supplies and textbooks, for example. Moreover, public provision of transportation and meals at school is less common in other countries than it is in the United States.

Direct financial contributions to schools occur more frequently at private than at public schools and more frequently at the higher education level. Private universities in the United States receive over 10 percent of their revenue in the form of private gifts and contributions to their endowment funds. Private elementary and secondary schools in the United States also receive direct financial support from corporations, associations, and religious denominations. Private elementary and secondary schools in the United States and other countries may also receive "in-kind" contributions of building space, equipment, and supplies from the religious denominations or social and cultural organizations that sponsor them.

In some countries, moreover, private groups are direct providers of education. In the German and Austrian "dual systems," for example, high school students who choose the vocational track generally spend most of each school week inside businesses or factories where they receive instruction in a trade from employees of the company practicing that trade. This instruction typically takes place in a classroom at the worksite, with the workplace used for demonstrations of work practices and for direct employment of the students after they have learned enough of the trade to be employable. Firms participating in these "youth apprenticeship" programs typically receive a tax deduction, but no direct public support. Youth apprenticeship programs like these, where students spend part of each school week in school and the other part at a worksite, are gaining in popularity in the United States, but remain uncommon.

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[*] The primary sources for this sidebar include: S.M. Barro, "Preliminary findings from the expenditure comparability study" (Washington, D.C.: SMB Economic Research, Inc., 1993); OECD, *Education at a Glance* (Paris: OECD, 1993); and J. Sherman, *Report on international comparisons of school expenditures* (Washington, D.C., Pelavin Associates, Inc., 1992).

In some countries, private funding of education is even more important on the "fringes" of the traditional education system. Japanese *jukus*, for instance, have made "after-hours" supplemental instruction famous (but one can find the equivalent even in the United States in private firms' training courses for college-entry exams). Countries vary widely in their public support of early childhood education, too. Some, such as France and the Scandinavian countries, provide it largely through public programs, while others, such as the United States, Germany, Spain, and Canada, mostly leave its provision to the private sector. Countries also vary widely in their public support of non-degree-granting, occupationally specific trade and vocational schools—those that we refer to in the United States as "proprietary" schools.

It is very likely that the private share of education is generally underestimated, however. Two factors account for this underestimation. First, education on the "fringes" (in private nursery, after-hours, or proprietary schools), generally transpires outside the jurisdiction of government education authorities and their data collectors. Therefore, much private education financing simply remains uncounted. Second, some countries do not collect education finance data even from regular private elementary and secondary schools. In the United States, for example, one measure of the independence private elementary and secondary schools enjoy is the relative freedom from state data collection requirements.

Indicator 42: Current Public Expenditure on Education as a Percentage of GDP

Gross domestic product (GDP) is an aggregate measure of the value of goods and services—or national income—produced in a country. The percentage of GDP spent on education from public sources corresponds to the share of a country's income that the *public* sector invests in education. Variations in this measure across countries reflect differences in national priorities and commitment to education, but these variations are also influenced by the share of students in the population. This indicator is not a measure of total investment in education, since private educational expenditures account for at least 20 percent of total educational spending in some countries (e.g., the United States and Japan).

- In 1992, the United States devoted approximately 5 percent of its GDP to public spending on education. Among the G–7 countries, only Canada devoted a larger share of GDP to public spending on education than did the United States. At 3.4 and 2.7 percent, respectively, the former West Germany and Japan spent the smallest shares of GDP on public spending on education of all the countries reported (G–7 and other).
- The United States also devoted a larger share of GDP (1.2 percent) to public funding of higher education than did all of the other G–7 countries except Canada (2.4 percent). Japan devoted a considerably smaller share of GDP to funding higher education (0.3 percent) than did all other countries reported (G–7 and other).

Table 42: Current public expenditure on education* as a percentage of GDP, by level of education and country: 1992

Country	Preprimary	Primary and secondary	Higher education	Total
G–7				
Canada	—	4.4	2.6	7.0
France	0.6	3.4	0.8	4.8
West Germany (former)	0.2	2.0	0.8	3.0
Italy	—	3.3	0.6	3.9
Japan	0.1	2.3	0.3	2.7
United Kingdom	—	3.9	1.0	4.9
United States	**0.2**	**3.5**	**1.2**	**4.9**
Other				
Australia	0.0	3.1	1.6	4.7
Austria	—	3.3	1.0	4.3
Belgium	—	3.4	0.9	4.3
Czech Republic	—	2.7	0.6	3.3
Denmark	0.9	4.1	1.1	6.1
Finland	0.6	4.5	1.8	6.9
Hungary	0.8	3.9	1.3	6.0
Ireland	0.4	3.5	1.0	4.9
Netherlands	0.3	2.9	1.3	4.5
New Zealand	—	3.2	2.0	5.2
Norway	0.7	4.8	2.0	7.5
Spain	0.3	3.0	0.7	4.0
Sweden	1.1	4.5	1.0	6.6
Switzerland	—	3.8	1.0	4.8

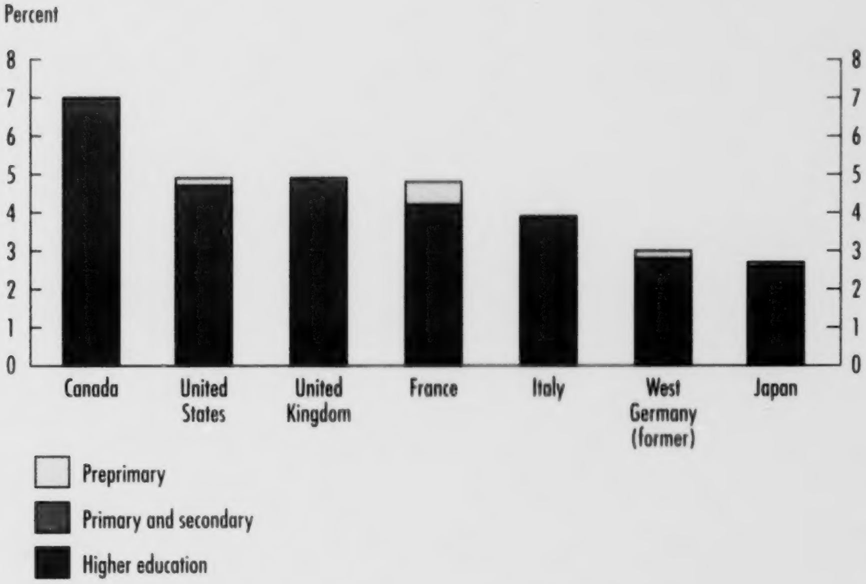
—Not available.

*Undistributed expenditures are not included.

NOTE: See supplemental note to Indicator 42 for details on indicator calculation for Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, the former West Germany, Ireland, Italy, Japan, New Zealand, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United States and for information regarding the methodology used for adjusting inflation rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 42: Current public expenditure on education as a percentage of GDP, by education level and G-7 country:* 1992



*Countries are sorted in descending order by total current public expenditure on education as a percentage of GDP.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 43: Per Student Expenditure on Education

Expenditure per student is a measure of the public investment that a country devotes annually, on average, to each student's education. It allows comparisons of estimated *absolute* levels of support (or cost) for education. Current public expenditure per student relative to GDP per capita places the expenditure data per student in a *relative* perspective. It allows for comparisons among countries with wide differences in national wealth by examining what each country spends on its students relative to its available resources. For example, a wealthy country with a large per student expenditure may actually be devoting approximately the same share of its available resources to education as a less wealthy country with a lower per student expenditure. Variations in per student expenditures reflect differences in national wealth, national spending priorities, the relative price of local educational resources (such as teacher salaries), variations in the quantities of resources devoted to education (such as teachers and administrators), and the size of the corresponding private education sector.

- In 1992, the United States spent more per student on primary and secondary education (in constant U.S. dollars) than did all of the other G–7 countries. However, U.S. per student spending on higher education ($7,097) was in the mid-range of the G–7 countries.
- Relative to GDP per capita, the United States spent more per student on primary and secondary education than did all but three of the other G–7 countries (Canada, Italy, and the United Kingdom, at 23.9, 22.9, and 21.3 percent, respectively). The United States also spent more per student on higher education relative to GDP than most of the G–7 countries, although the United Kingdom and Canada outspent the United States substantially according to this measure. At the primary and secondary and the higher education levels, Japan had the smallest expenditure relative to GDP per capita of all the G–7 countries.
- In all of the countries presented except Italy and Japan, current public expenditures per student were significantly larger for higher education than for secondary education and below, whether measured in U.S. dollars or relative to GDP per capita. About half the countries reported, including the United States, spent between 1.2 and 2 times the resources per student on higher education as on secondary education and below, and another half spent between 2 and 5 times the resources per student on higher education.

Table 43: Current public expenditure per student[1,2] (in constant 1991–92 U.S. dollars) and relative to GDP per capita, by education level and country: 1992

Country	Current public expenditure per student					
	Constant 1991–92 U.S. dollars[3]			Percent of GDP per capita		
	Preprimary	Primary and secondary	Higher education	Preprimary	Primary and secondary	Higher education
G–7						
Canada	—	$4,752	$10,715	—	23.9	53.8
France	$2,302	3,636	4,701	12.4	19.6	25.4
West Germany (former)	1,180	3,048	5,749	5.8	15.0	28.3
Italy	—	3,978	3,676	—	22.9	21.2
Japan	1,300	2,698	2,103	6.6	13.6	10.6
United Kingdom	—	3,473	9,154	—	21.3	56.2
United States	**2,286**	**4,950**	**7,097**	**9.7**	**21.1**	**30.2**
Other						
Australia	—	2,853	6,001	—	16.9	35.5
Austria	—	4,116	5,378	—	22.8	29.8
Belgium	—	3,540	5,794	—	19.6	32.1
Czech Republic	—	1,097	3,414	—	15.3	47.7
Denmark	5,627	4,710	6,195	32.0	26.7	35.2
Finland	5,284	3,911	7,647	36.5	27.0	52.8
Hungary	1,424	1,613	8,171	20.7	23.4	118.6
Ireland	1,574	2,056	5,304	12.3	16.1	41.6
Netherlands	2,119	2,842	8,118	12.5	16.8	47.9
New Zealand	—	2,254	8,503	—	15.9	60.2
Norway	4,206	5,262	6,690	23.8	29.8	37.9
Spain	1,638	2,006	2,496	12.8	15.7	19.5
Sweden	6,076	5,289	7,192	35.3	30.7	41.5
Switzerland	—	5,855	11,396	—	26.3	51.2

—Not available.

[1] Expenditure per student is calculated by dividing total expenditure for education at a given level by the number of students enrolled in both public and private schools. Enrollment is based on headcount estimates for preprimary through 12th grade. For higher education, it is full-time equivalent enrollment.

[2] Undistributed expenditures are not included.

[3] Purchasing power parity (PPP) indices were used to convert other currencies to U.S. dollars. Because the fiscal year has a different starting date in different countries, within-country Consumer Price Indexes (CPI) were used to adjust the PPP indices to account for inflation. See supplemental note to Indicator 43 for additional information on PPP indices.

NOTE: See supplemental note to Indicator 43 for details on indicator calculation for Austria, Canada, the Czech Republic, Denmark, Japan, Sweden, and Switzerland, the methodology used for adjusting inflation rates, private expenditures, and PPP indices.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 43: Current public expenditure per student (in constant 1991–92 U.S. dollars) and relative to GDP per capita, by education level and G–7 country:* 1992

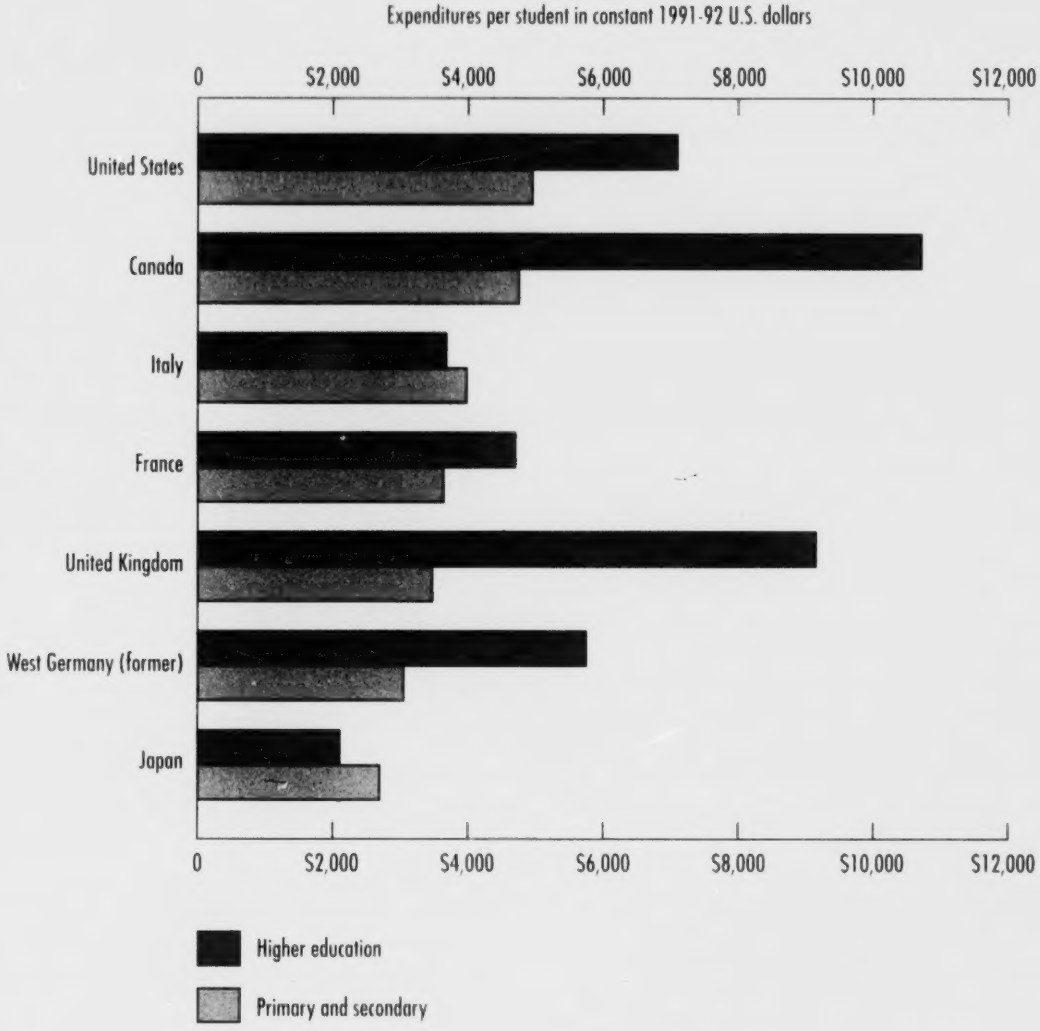
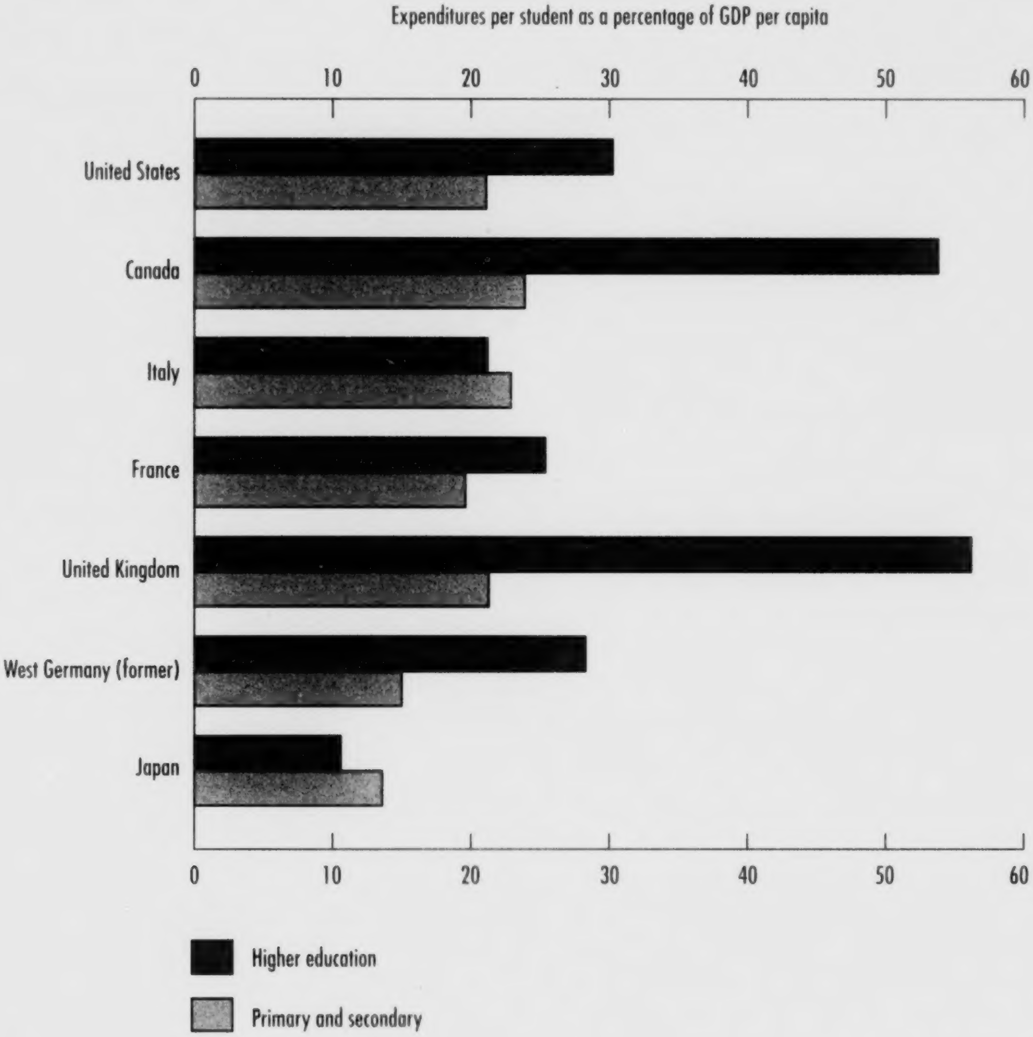


Figure 43: Current public expenditure per student (in constant 1991–92 U.S. dollars) and relative to GDP per capita, by education level and G–7 country:* 1992—Continued



*Countries are sorted in descending order by current public expenditure per student in constant 1991–92 U.S. dollars (primary–secondary).

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995

Indicator 44: Distribution of Funds by Level of Education

The distribution of current public expenditure across different levels of education reflects national educational goals and strategies concerning priorities for each educational level. The distribution is also influenced by the number of students enrolled at each level, which is, in turn, influenced by the duration of each level. To illustrate, public preprimary education is not available in all countries. Further, some countries or subsets of students within a country have an extra year of secondary school.[1] Moreover, the indicator does not give a complete picture of the distribution of public resources between the two levels, since some countries did not classify all of their expenditures. This indicator should not be interpreted as a measure of the resources devoted to education, but rather as an indicator of the distribution of resources between education levels.

- In 1992, the United States devoted approximately three-fourths of its current public education expenditure to preprimary through high school education and the remaining share to higher education. With the exception of Canada (which allocated a larger portion of expenditures to higher education) and Italy (which allocated a larger portion to preprimary through high school), the remaining G–7 countries also allocated approximately three-fourths of public education expenditure to preprimary through secondary education. The G–7 countries differed in the proportion of public education expenditure allocated to higher education. The proportion of public education expenditure devoted to higher education among the G–7 countries ranged from 36 percent in Canada to 9 percent in Japan.[2]

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[1] This indicator distinguishes between two broad levels of education: the preprimary through secondary level and the higher education level.

[2] In Japan, and to a lesser extent France, a significant percentage of public education expenditures were undistributed (12.5 and 8.5 percent, respectively), making interpretation of the figures for these countries difficult.

Table 44: Distribution of current public expenditure on education, by education level and country: 1992

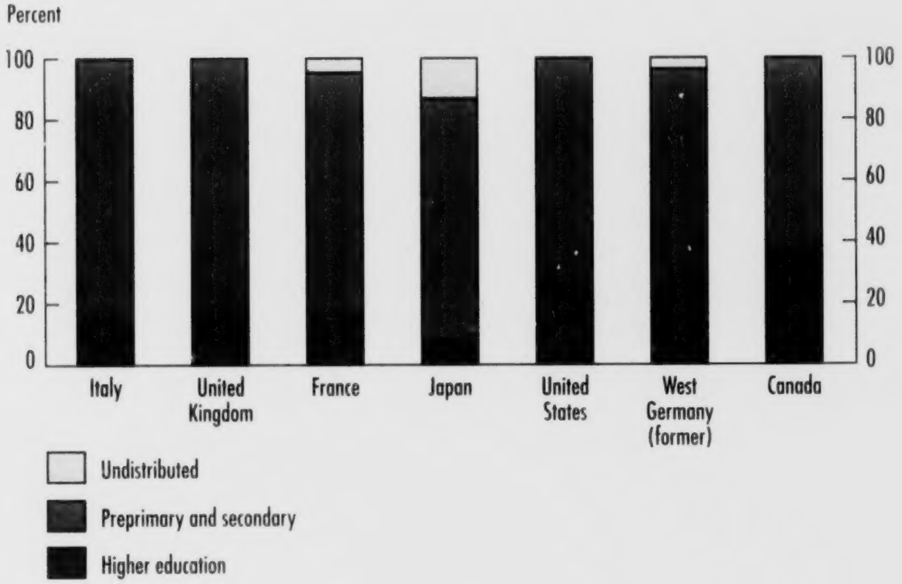
	Percent of public education expenditure		
Country	Preprimary–secondary	Higher education	Undistributed/ other
G–7			
Canada	62.7	37.3	—
France	78.9	16.4	4.7
West Germany (former)	70.0	26.3	3.7
Italy	85.3	14.7	—
Japan	78.6	8.3	13.2
United Kingdom	79.5	20.5	—
United States	**75.0**	**25.0**	**—**
Other			
Australia	66.7	33.3	—
Austria	77.2	22.8	—
Belgium	79.2	20.8	—
Czech Republic	81.2	18.8	—
Denmark	80.0	17.7	2.3
Finland	68.1	24.1	7.7
Hungary	76.5	21.8	1.7
Ireland	77.4	20.3	2.3
Netherlands	66.9	28.4	4.7
New Zealand	61.5	38.5	—
Norway	77.6	17.0	5.3
Spain	81.3	16.1	2.5
Sweden	85.0	15.1	—
Switzerland	79.9	20.1	14.5

—Not applicable or available.

NOTE: See supplemental note to Indicator 44 for details on indicator calculation for Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, the former West Germany, New Zealand, Norway, Spain, Sweden, Switzerland, and the United Kingdom.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 44: Distribution of current public expenditure on education, by education level and G–7 country:[1,2,3] 1992



[1] Countries are sorted in descending order by percentage of public education expenditure allocated to preprimary–secondary education.

[2] Totals may not add up to 100 due to rounding.

[3] Undistributed expenditures are allocated proportionally across other levels of education.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Indicator 45: Source of Funds for Education

Tracing the path of education expenditures back to their origin uncovers the level or levels of government and the sources (private and public) that bear primary responsibility for financing a country's education system. The initial source of money for education sometimes differs from the ultimate spender. For example, though local school districts in the United States generally operate and fund the local public schools, much of the financing arrives in the form of transfers from state governments. Some of the state money, in turn, arrives in the form of transfers from the federal government. The *initial sources* of those transferred funds, then, are state and federal governments. Likewise, the initial source of funds spent on public schools can be either public or private. Student tuition and fees are one example of a private source of public expenditure. Funding by private firms of youth apprenticeship programs in Germany and Austria is another example. Moreover, the initial source of funds spent on *private* schools can be either public or private. Unlike the United States, many other industrialized countries maintain large numbers of privately operated schools that are mostly or entirely publicly funded.

- In the United States, most public funding for primary through secondary education originated at the regional (state) or local levels in 1992; less than 10 percent originated at the central (federal) government level. In contrast, approximately three-fourths of public expenditure on primary through secondary education in France and Italy originated at the central level.
- At the higher education level in the United States, the majority of public funding originated at the regional (state) level. In every other country reported except Canada, the former West Germany, Belgium, Spain, and Switzerland, the majority of public funding originated at the central level.

Table 45a: Distribution of public and private expenditure on primary and secondary education, by initial source of funds and country: 1992

Country	Percent of all expenditure		Percent of public expenditure		
	Private sources	Public sources	Central	Regional	Local
G–7					
Canada	4.5	95.5	2.4	63.8	33.8
France	6.6	93.4	74.8	11.7	13.5
West Germany (former)	38.7	61.3	0.6	80.2	19.1
Italy	3.3	96.7	79.0	4.8	16.1
Japan	8.9	91.1	24.5	75.5	—
United Kingdom	5.1	94.9	6.5	—	93.5
United States	**9.1**	**90.9**	**7.6**	**47.9**	**44.5**
Other					
Australia	—	—	28.9	71.0	0.1
Austria	11.1	88.9	69.4	10.4	20.2
Belgium	0.4	99.6	—	95.7	4.3
Czech Republic	10.5	89.5	68.4	—	31.6
Denmark	—	100.0	28.4	11.4	60.2
Finland[1]	—	—	70.6	—	29.4
Hungary	6.7	93.3	71.8	—	28.2
Ireland	4.9	95.1	95.7	—	0.1
Netherlands	—	100.0	96.4	—	3.6
New Zealand	—	—	100.0	—	—
Norway	—	100.0	—	—	—
Spain	12.2	87.8	48.3	44.6	6.3
Sweden	—	100.0	—	—	—
Switzerland	6.8	93.2	3.4	52.2	44.4

—Not available or not applicable.

[1] Public proportion is 92.3 percent for all levels of education.

NOTE: See supplemental note to Indicator 45 for details on indicator calculation for Austria, Belgium, Canada, the Czech Republic, Denmark, the European Community countries, Finland, the former West Germany, Hungary, Ireland, Italy, Japan, Norway, Spain, Switzerland, and the United Kingdom and methodology for adjusting inflation rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Table 45b: Distribution of public and private expenditure at the higher education level, by initial source of funds and country: 1992

	Percent of all expenditure		Percent of public expenditure		
Country	**Private sources**	**Public sources**	**Central**	**Regional**	**Local**
G–7					
Canada	2.6	97.4	29.4	70.6	0.0
France	8.9	91.1	91.6	4.8	3.6
West Germany (former)	0.0	100.0	16.0	83.1	0.8
Italy	29.3	70.7	99.6	—	0.6
Japan	60.3	39.7	86.0	14.0	—
United Kingdom	0.0	100.0	93.6	0.0	6.4
United States	**45.5**	**54.5**	**36.2**	**57.9**	**5.9**
Other					
Australia	0.0	100.0	73.5	26.4	0.0
Austria	19.2	80.8	98.8	0.3	0.9
Belgium	1.0	99.0	0.0	99.6	0.4
Czech Republic	11.4	88.6	100.0	0.0	—
Denmark	1.2	98.8	87.8	1.3	10.1
Finland[1]	—	—	91.7	0.0	8.3
Hungary	6.0	94.0	100.0	—	0.0
Ireland[2]	16.7	83.3	77.4	0.0	0.0
Netherlands	0.0	100.0	100.0	0.0	0.0
New Zealand	—	—	100.0	0.0	0.0
Norway	0.0	100.0	—	—	—
Spain	16.6	83.4	49.0	50.0	0.9
Sweden	0.7	99.3	—	—	—
Switzerland	19.8	80.2	44.5	54.7	0.7
Turkey	4.1	95.9	—	—	—

—Not available or applicable.

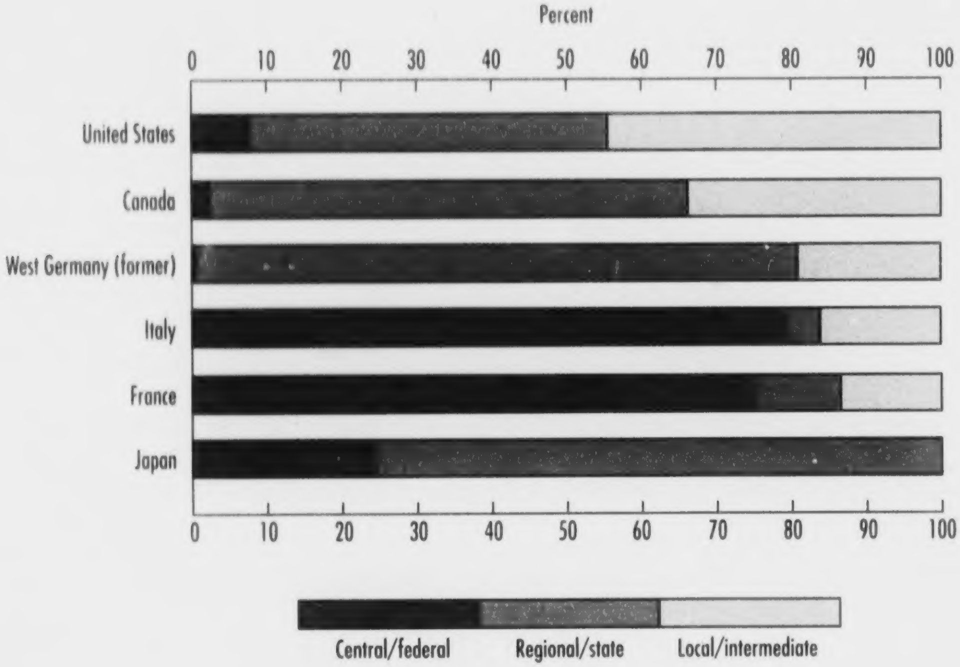
[1] Public proportion is 92.3 percent for all levels of education.

[2] The other source of funds for Ireland is the European Community.

NOTE: See supplemental note to Indicator 45 for details on indicator calculation for Austria, Belgium, the Czech Republic, Denmark, the European Community countries, Finland, the former West Germany, Hungary, Ireland, Italy, Japan, Norway, Spain, Switzerland, and the United Kingdom and the methodology for adjusting inflation rates.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 45a: Distribution of public education expenditure on primary and secondary education, by initial source of funds and G–7 country,[1,2] 1992

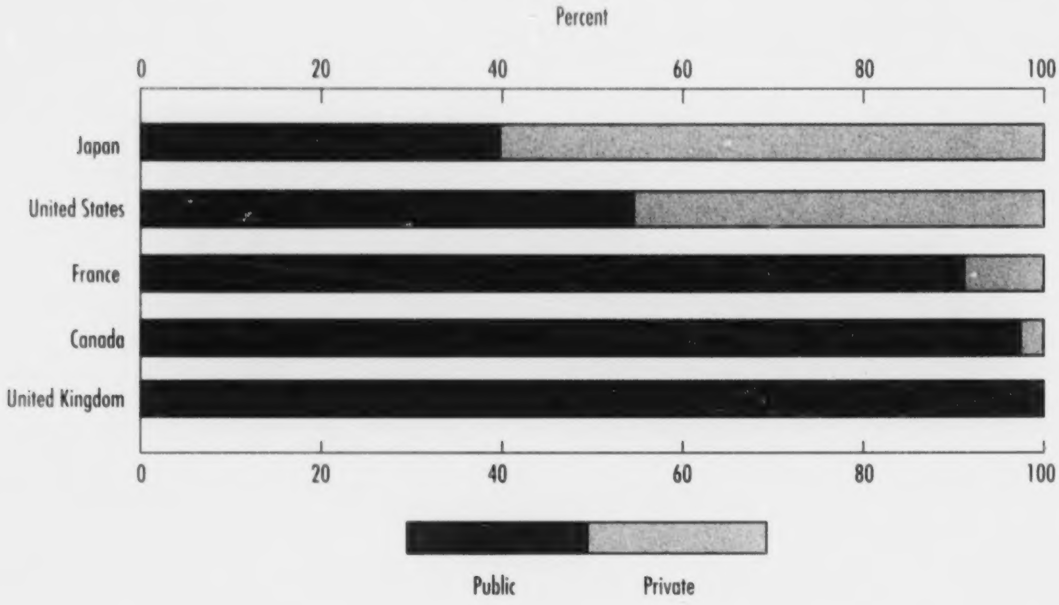


[1] No data available for the United Kingdom.

[2] Countries are sorted in descending order by percentage of funds raised at the local level.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Figure 43b: Distribution of public and private education expenditure at the higher education level, by initial source of funds and G-7 country:[1,2] 1992



[1] No data available for the former West Germany and Italy.

[2] Countries are sorted in ascending order by the share of expenditure from public sources.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

What is "public" and "private" education?[*]

In the United States, public and private schools are generally distinguished by the distinct separation of both their governance and their funding. Typically, public schools are governed and financed by public authorities, while private schools are governed and financed by private authorities. In this respect, the U.S. system is atypical among the developed countries.

Many developed countries finance both public schools and private and religious schools with public funds, and they have done so for many years. The proportion of public expenditure used to subsidize private education amounts to 4 percent in the United States, 7 percent in Switzerland, 10 percent in Australia, and nearly 12 percent in France. In Belgium and the Netherlands, private education is entirely publicly funded; thus, the proportion of funding targeted to private-school students approximates the proportion of private-school students in the student population. The issue of public funding in many of these countries does not provoke the widespread controversy that it does in the United States. In return for the funding, the private and religious schools in some countries agree to honor government standards in matters of curriculum, class size, and the like; and their students must still pass the same national examinations as their public-school peers.

The education finance and governance systems in place in Germany, France, and the Netherlands provide an interesting contrast to the system currently existing in the United States. The following paragraphs provide an overview of these systems.

Historically, Germany has had a variety of school types: public schools with a Catholic character, public schools with a Protestant character, public schools with some other distinctive world view, public schools without a religious orientation, and private schools. As in the United States, each German state is responsible for operating its own schools; therefore, the extent to which certain types of schools exist and the level of religious instruction varies among states as well as among localities within the states.

Private schools in Germany are permitted to select both their pupils and teachers and are not rigidly tied to state regulations in regard to the choice of teaching material or the number of weekly lessons. In return for public funding, however, they must hold state examinations and issue reports and certificates, just as would a state-run school. As long as their students perform adequately on the state exams, the private schools are generally left alone.

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[*] The primary sources for this sidebar include: S.M. Barro, *Preliminary findings from the expenditure comparability study* (Washington, D.C.: SMB Economic Research, Inc., 1993); Organization for Economic Co-operation and Development, *1986 Education in OECD countries: A compendium of statistical information* (Paris: OECD, 1989); Organization for Economic Co-operation and Development, *1988-90 Education in OECD countries: A compendium of statistical information* (Paris: OECD, 1993); Organization for Economic Co-operation and Development, *School: A Matter of Choice* (Paris: OECD, 1994); *Choice of Schools in Six Nations* (Washington, D.C.: 1989); U.S. Department of Education, Office of Policy and Planning, *International Education Comparisons* (Washington, D.C.: September, 1992). S.M. Burro, J.D. Sherman, R. Phelps, *International Expenditures Comparability Study: Draft Report* (Washington, D.C.: Pelavin Associates, Inc. and SMB Economic Research, Inc., 1994).

The French public and private schools differ markedly from the German. Religious instruction does not exist in French public schools, although they are not necessarily "value-neutral" either, as the French state is interested in promoting its own values and beliefs among its citizens. Like Germany, however, France provides government funding to offset the cost of private schooling. Nonpublic schools have several alternatives with regard to governance and funding: (1) to continue completely independent of government intervention, subject to employing qualified teachers; (2) to be absorbed into the national public education system; (3) to accept government requirements as to curriculum and testing in exchange for staff salaries (*contrat simple*); and (4) to accept, in addition, some government control over pedagogy and the selection of teachers, in exchange for operating expenses as well as salaries (*contrat d'association*). Among Catholic schools, most elementary schools, with their limited funding needs, choose the contrat simple; while many secondary schools, having higher operating costs, choose the contrat d'association. Schools receiving funds from the contrat d'association must demonstrate that they have a distinctive character or philosophy not catered to in the public system. Private schools without a religious orientation generally choose to remain independent of government intervention, though they do receive a certain amount of public funding under a different law.

The Netherlands finances public and private schools on a completely equal basis, with the Dutch government paying directly for teachers, buildings, and other school costs in both sectors. Given the central government's direct financing of private schools' expenditure on the same basis as schools governed by municipalities, they are not as independent as private schools in most other countries; in fact, all schools must follow the same government rules with respect to administration and curriculum. The most significant difference between private and public schools is that only the former may turn away prospective pupils under certain prescribed conditions. Another difference is that private schools may charge fees for extracurricular activities. In 1990, 31 percent of primary pupils were in public schools and the remaining 69 percent were in private schools, either Protestant, Catholic, or neutral.

Dutch education law requires a "responsible authority" for each school. This may be the national government (for some secondary and higher education institutions) or the local government (for elementary education), in which cases the school is considered public. If the responsible authority is an association, foundation, institution, church council, or religious community, the school is considered private. In order to start up, obtain funding, and remain in operation, a private school must show that it will be attended by a sufficient number of students. The specific number varies according to the size of the community. If no other school is available that provides an education of the same denominational or pedagogical character, the specific numbers are lowered.

Public support of private elementary and secondary schools in the United States is meager. In a few states, students enjoy publicly provided transportation to private school or their parents receive tax credits equal to the amount of their tuition bills. Private schools can also receive federal education grants for poor children, such as those for compensatory instruction or reduced-fee lunches. Private universities in the United States, however, generally receive large amounts of public funds. They take the form of federal or state student loans, federal research grants, and state grants for academic programs that serve state residents. All private schools in the United States at all levels also obtain property-tax relief.

MATRICES OF COMPARATIVE INFORMATION ON COUNTRIES' EDUCATION SYSTEMS

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Primary and Secondary School Teacher Training and Certification Requirements

Country	Duration of postsecondary academic and in-school training (years)	Academic program	In-school training	Certification examination	Renewal and upgrading requirements
United States	4	Particular emphases are shaped by state government regulations, but usually include general study with a concentration in the academic subject that potential teachers plan to teach (if they are preparing for secondary instruction) and in pedagogical studies.	Generally included in postsecondary study	Individual states set minimum qualifying scores on the National Teacher's Exam or state certification tests.	State policies vary regarding upgrading requirements. Approximately 45% of primary teachers, 55% of lower secondary teachers, and 65% of upper secondary teachers earn a Master's degree by mid-career.
Canada	4 or 5 (mostly 5)	General education at the university in arts or sciences, and 1-year of professional training, which includes instruction in curriculum and teaching methods, classes in contextual dimensions, and student teaching. The 1-year professional training can be done concurrently with degree work or after a degree has been earned.	Included in postsecondary study.	None	Provincial policies vary regarding upgrading/renewal requirements.
France	**Primary:** 5 **Secondary:** 5 or more	Three years university *license* program. To prepare for competitive exam, most future teachers spend 1 year at IUFM (Institut Universitaire de Formation des Maitres). After exam, 1 (additional) year of professional training at IUFM is required. *Professeurs agreges* must obtain a 4-year university degree in the subject to be taught in addition to the exam and IUFM training.	Included in the IUFM. Future secondary teachers teach a class for 4–6 hours a week for the whole year. Future primary teachers do it for 8 weeks during the final semester of the year.	The examination includes sections on academic subjects and pedagogy. The exam differs for primary and secondary teachers. The certification process also takes into account course work and practical application.	None
Germany[1]	**Primary:** 5 **Lower secondary:** 5 to 6.5 **Upper secondary:** 6.5	Primary, Hauptschule, and Realschule teachers spend at least 6 to 8 semesters studying pedagogy and at least 2 academic subjects. Prospective Gymnasium teachers spend 8 to 10 semesters studying pedagogy and at least 2 academic subjects. This phase ends with the first state examination.	After university phase, 18 to 24 months of school-based training, in addition to various lectures and the study of pedagogy. Phase ends with the second state examination.	Must pass first and second state examinations, consisting of a thesis, two demonstration lessons, and an oral and written section.	Upon passing second state examinations, teachers are eligible for tenure-track employment.

Primary and Secondary School Teacher Training and Certification Requirements *(Continued)*

Country	Duration of postsecondary academic and in-school training (years)	Academic program	In-school training	Certification examination	Renewal and upgrading requirements
Italy	**Primary**: 3 to 4 **Secondary**: 4 to 5	**Primary**: Primary school teachers receive general academic and pedagogical training in 4-year upper secondary teacher preparatory programs (Instituti magistrali). **Secondary**: Formal education/training spent earning regular 4-year university degree with little, if any, focus on pedagogy. Training is followed by open competition for teaching staff and a 1-year in-school training program for competition winners.	**Primary and Secondary:** One year of in-school training after qualifying by competitive examination.	Job placement determined by competitive national examination, consisting of a written examination on subject-related topics, and an interview.	Regular in-service training and development courses focusing on content and methodology required by law and organized by regional institutes for research and in-service training in education (IRRSAE) and by schools.
Japan	**Advanced**: 5 **First class**: 4 **Second class elementary and lower secondary certificate**:[2] 2	**First class elementary:** Four years of postsecondary study (Bachelor's degree), focusing on general subjects, subject of specialization, and pedagogy. **First class secondary**: Bachelor's, with less focus on pedagogy than elementary and lower secondary teacher candidates.	**Upper secondary:** 2 weeks. **Elementary and lower secondary:** 4 weeks. Induction program for first-year teachers includes 60 days of school-based training, 30 days of lectures, seminars, and other training sessions.	Must pass prefectural appointment examinations, consisting of written tests in general education and fields, skill tests in physical education, music, and art, and interviews.	Teachers required to pursue in-service training. Prefectural boards of education required by law to plan and encourage in-service training activities.
United Kingdom (England and Wales)	**Primary**: 3 to 4 **Lower secondary**: 3 to 4 **Upper secondary**: 4 to 5	Standard Initial Teacher Training (ITT) program consists of either a) a 3- or 4-year undergraduate program leading to a Bachelor's; or b) a 1-year postgraduate course in teaching and educational methods and assessment for those who have already gained a first degree.	a) For undergraduate route, 32 weeks of practical training and school experience. b) For postgraduate route, 24 weeks of practical training and school experience.	Certification is granted after an initial year of teaching to degree holders. There is no written test, but the process is very structured.	None required by national policy, but strong expectations at school level that progressive/ambitious teachers will engage in appropriate in-service provided by local authorities, universities, and others.

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[1] Vocational and technical school teachers. The more academically oriented must complete 4 years of university study and 1 year of specialized training and teacher training. Practice oriented teachers are qualified practitioners who have also had further training at a technical school as well as teacher training. Teachers at senior technical schools must have the same qualifications as gymnasium teachers, and must also have several years of actual professional experience.

[2] The first class certificate is the preferred credential at all levels. Some teachers earn a second-class certificate in secondary subjects.

Entrance and Exit Examinations

Country	Existence of entrance or exit exams (y/n)	Name and type of examination	Level responsible	Who takes examination and when?	Consequences of assessment
United States	Yes	SAT - University entrance examination ACT Minimum competence tests in some states.	Non-governmental. National assessment systems; administrated locally.	College-bound students in last 2 years of high school.	Varies by college or university. Most 4-year colleges require exam, most 2-year colleges do not.
Canada	Yes	Exit exams from secondary school in some provinces.	Province	Secondary school students at end of secondary school.	Varies by province.
France	Yes	a) Baccalaureat - Exit examination from lycee (academic high schools) and university entrance examination. b) Brevet des college: non-compulsory examination at the end of lower secondary.	National (however test content may vary by region)	a) All lycee students. b) Nearly all "college" students (junior high school).	a) Passing baccalaureat determines university placement. b) Passage may give access to lycee, but is not required. Designed to gauge standard of education offered during lower secondary education.
Germany	Yes	Abitur - Exit examination from Gymnasium (academic high schools).	State	All Gymnasium students.	Passage provides access to university-level education; allows students to continue studies at university-level institutions.
Italy	Yes	a) Esame di licenza - Exit examination from lower secondary school and entrance examination to upper secondary school. b) Esami di maturita - High school graduation examination.	National	a) All lower secondary school students. b) Upper secondary school students after the end of their course of study (usually 4 or 5 years in duration).	a) Successful students may enroll in any secondary school. b) May have some bearing on employment and university placement.

Entrance and Exit Examinations *(Continued)*

Country	Existence of entrance or exit exams (y/n)	Name and type of examination	Level responsible	Who takes examination and when?	Consequences of assessment
Japan	Yes	a) Entrance examination for upper secondary school; b) Entrance examination for private secondary schools; c) Test of the National Center for University Entrance Examination (TNCUEE); d) Entrance examinations for individual universities; and e) Entrance examinations for colleges of technology.	a) Prefecture (regional/district level) b) Administered by individual schools c) National d) Administered by individual universities e) National for public national schools; local, public, and private administer their own examinations	a) All students seeking admission to high school. b) Students seeking admission. c) All students seeking university admission. d) Students seeking admission to specific universities. e) Students seeking admission to colleges of technology.	a) Determines placement in high school. b) Determines placement in high school. c) and d) Selection and placement in university system or college of technology.
United Kingdom (England and Wales)	Yes	a) General Certificate of Secondary Education (GCSE). b) General Certificate of Education Advanced Level (A level) and Advanced Supplementary (AS level) - for entrance to postsecondary institutions.	a) and b) National	a) All upper secondary school students at age 16. b) All students seeking university admission, as well as some others. Most students take examinations in 2–3 subjects. Typically taken at age 18.	a) No standard policy regarding consequences. b) Major factor in higher education placement.

Curriculum Standards

Country	Highest level at which standards are set	Nature of standards	Subjects covered by curriculum standards	Grade levels affected	Control over textbooks
United States	State	Standards vary across states and localities and may include content, student performance (minimum competencies), or school delivery standards.	Language arts, mathematics, science, and social studies in the 41 states that have standards.	In the 41 states that have standards, standards cover each grade level (this varies depending on the type of standard).	Some states have textbook review committees, although they are not necessarily tied to standards.
Canada	Province	Specificity varies across provinces. Provinces have curriculum statements and guidelines of varying detail. Primary education: Grouped by level and then by grade within the level. Secondary: Level- and course-specific.	In general, more clearly defined curriculum requirements are set in mathematics, science, social studies, English and French Language Arts, and English and French as Second Languages. Quebec has specific curriculum objectives for all subjects.	All grade levels.	All provinces review and approve textbooks in light of compatibility with official curriculum and publish a list of approved textbooks.
France	National	Specifies aims and content of subjects taught.	All subject areas.	All grade levels.	Textbooks are selected at school or local level. No national approval system.
Germany	Land (state)	Specifies aims, content, instruction, and assessment methods of subjects taught.	Core subjects (German, one foreign language, math, physics/chemistry, biology, geography, history, world of work and social studies, religious instruction, music, art, politics, physical education, and local studies).	All grade levels.	N/A*
Italy	National	Education objectives and content for each subject area.	All subject areas.	Broad levels of education (e.g., primary, junior high school).	Textbooks are chosen by teachers' committees based on a set of national criteria.
Japan	National	Broad guidelines for the objectives and content of each subject area.	All subject areas.	All levels of education (kindergarten, primary, lower secondary, upper secondary, special education).	Ministry approves textbooks for use in schools.
United Kingdom (England and Wales)	National	National curriculum specifies targets for learning and the measurement of progress, delineates what should be taught in order to meet the targets, and assessment arrangements.	Core (mathematics, English, science) and foundation (technology, history, geography, foreign language, music, art, physical education, Welsh) subjects.	Ten levels of attainment targets for each foundation subject, none of which are intended to be correlated with student age or school year.	Schools are responsible for selecting appropriate text books.

* Not available

Structure and Governance of Education Systems in G–7 Countries

Country	Ages for compulsory schooling	Structure of system[1]	Differentiation of schools (age at which differentiation occurs and type of differentiation - through upper secondary)	Postsecondary education	Degree of administrative and supervisory centralization
United States	6–16	6-2-4; 6-3-3; 8-4; 6-6; or 5-3-4	None[2]	2-year community and junior colleges; 4-year undergraduate colleges; universities.	Highly decentralized. Federal government does not have the power to control schools directly.
Canada	6–16	6-3-3; 8-4; also 7-5, 6-5, 5-3-4, and 7-3-2	None[2]	1–2-year nondegree-granting community colleges. 3–4-year degree-granting and nondegree-granting community colleges and universities.	Highly decentralized. No national educational administrative body.
France	6–16	5-4-3	Age 15[3] **General and technological high schools** - leading to *baccalaureat* and higher education **Vocational schools** - leading to *Certificat d'Aptitude Professionelle* (CAP), or *Brevet d'Etudes Profesionnelles* (BEP) or *Baccalaureat Professionel*	Polytechnic colleges; engineering and business schools, universities.	Highly centralized. The national Ministry of Education controls formal education at all levels. Recently, more independence has been given to local bodies.
Germany	6–16[4]	a) 4-6-3 b) 4-6 c) 4-5	Age 10 **a) Gymnasium** - leading to university entrance qualification **b) Realschulen** - leading to vocational schools or apprenticeships **c) Hauptschulen[5]** - leading to vocational schools or apprenticeships	Polytechnic colleges, universities.	Highly decentralized. States (Lander) have primary administrative and supervisory authority over education.
Italy	6–14	5-3-5	Age 14 Many different types of secondary schools exist, each catering to a particular career orientation	Universities (very little provision for degrees other than *laurea*, a 4–5 year degree).	Divided between central and regional authority.

Structure and Governance of Education Systems in G–7 Countries *(Continued)*

Country	Ages for compulsory schooling	Structure of system[1]	Differentiation of schools (age at which differentiation occurs and type of differentiation - through upper secondary)	Postsecondary education	Degree of administrative and supervisory centralization
Japan	6-15	6-3-3	Age 15 After completion of lower secondary school, students enroll in academic, vocational, or comprehensive upper secondary schools.	Technical colleges; junior colleges; universities.	Highly centralized - National Ministry of Education, Science and Culture has primary responsibility for supervision of schools; prefectural boards of education provide for local administration.
United Kingdom (England and Wales)	5-16	6-4-2	Age 16 After completion of compulsory education, students may continue at same school for 2 more years ("sixth form") or transfer to separate institution for further academic or vocational education.[6]	Colleges (not unlike community colleges, but with strong vocational elements); universities (autonomous) (virtually all are public and funded by national public agencies acting for the government).	Decentralized - Responsibility for college education shared by central and local governments until 1992. From then on colleges joined universities in becoming "incorporated" (autonomous) institutions.

[1] Years of primary - lower secondary - upper secondary school.

[2] Secondary schools are generally comprehensive, but a small number of vocational schools exist.

[3] Students may enter special classes to prepare for technical stream at age 13.

[4] Students must be enrolled at least part-time through age 18.

[5] It is possible to transfer from the Hauptschulen to the Realschulen, and from the Realschulen to the Gymnasium.

[6] Traditionally, students took examinations for admittance to selective secondary schools at age 11 ("aa-plus"), but this practice has almost disappeared over 25 years, though there is some evidence of resurgence in a few areas.

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SUPPLEMENTAL NOTES AND TABLES

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SUPPLEMENTAL NOTES AND TABLES

Indicator 1

Notes on Figures and Tables

Australia
Lower secondary education includes ungraded secondary students. Due to difficulties in categorizing some school levels, participation figures for nonuniversity higher education are high.

Czech Republic
Most part-time students are enrolled in adult education and their age is unknown. They experience the same curricula and take the same examinations as full-time students.

Denmark
All formal regular education is classified as full-time. Numbers refer to persons enrolled on October 1, 1991. Adult education is excluded.

Hungary
Disabled students are included in primary and lower secondary education. Age distribution data are estimated at the lower secondary education level for 14-year-olds and over, at the upper secondary education level for 19-year-olds and over, and at the higher education level for 24-year-olds and older.

Italy and Sweden
No distinction between full-time and part-time at higher education.

Japan
There are an additional 147,500 students, whose ages are unknown, who are not included.

Norway
Figures are estimates for primary and lower secondary education.

United States
There is no distinction between full- and part-time at upper secondary education.

Technical Notes

Calculation of Full-Time Equivalent Scores

For the indicators on per student expenditure and participation rates, all part-time enrollments are converted into full-time equivalents. Full-time equivalents were calculated using the following convention:

> Preprimary-secondary levels: one part-time enrollment equals one full-time enrollment.
>
> Higher education levels: two part-time enrollments equal one full-time enrollment.

In the case of preprimary, primary, secondary, and special education, part-time students are counted as full-time without conversion. In higher education, the duration of studies is typically longer if students proceed through at less than full-time pace. Therefore, conversions are made.

Supplemental Table 1 details the coefficients used for calculating full-time equivalent numbers by level of education.

Calculation of Enrollment Ratio

The enrollment ratio is calculated by dividing the total number enrolled at all levels, irrespective of age, by the population in the target age range.

Indicator 2

Notes on Figures and Tables

Austria and Denmark

Children in day care are excluded.

Czech Republic

There are no kindergartens outside the public sector.

Germany

Table 2 shows a net enrollment rate of 115.1 for 6-year-olds. This overstated figure is due to the fact that the Microcensus, which is the same for these data, was conducted at the beginning of May while the population data are from January 1st.

Hungary

Figures are estimates.

Japan

Only kindergartens are included. Day nurseries, which are social welfare institutions, are excluded.

Supplemental Table 1: Coefficients used for calculating full-time equivalent numbers, by level of education and country: 1992

Country	Preprimary	Primary	Lower secondary	Upper secondary	Nonuniversity higher education	University education
G–7						
Canada	2.00	1.00	1.00	1.00	3.00	3.00
France	1.00	1.00	1.00	1.00	1.00	1.00
West Germany (former)	1.00	1.00	1.00	1.00	2.00	2.00
Italy	1.00	1.00	1.00	1.00	1.00	1.00
Japan	1.00	1.00	1.00	1.00	2.00	2.00
United Kingdom	1.00	1.00	1.00	2.00	2.86	2.86
United States	**2.00**	**1.00**	**1.00**	**1.00**	**3.00**	**2.82**
Other						
Australia	1.00	1.00	3.37	1.00	4.66	3.89
Austria	1.00	1.00	1.00	1.00	2.00	2.00
Belgium	1.00	1.00	1.00	1.00	2.00	2.00
Czech Republic	1.00	1.00	1.00	1.00	2.00	2.00
Denmark	1.00	1.00	1.00	1.00	1.00	1.00
Finland	1.00	1.00	1.00	1.00	1.00	1.00
Hungary	1.00	1.00	1.00	1.00	1.00	1.00
Ireland	1.00	1.00	1.00	2.00	2.00	2.00
Luxembourg	1.00	1.00	1.00	1.00	2.00	2.00
Netherlands	1.00	1.00	2.01	2.00	2.00	2.00
New Zealand	2.00	1.00	2.00	2.00	2.00	2.00
Norway	1.00	1.00	1.00	1.00	2.00	2.00
Portugal	1.00	1.00	1.00	1.00	2.00	2.00
Spain	1.00	1.00	1.00	2.00	2.00	2.00
Sweden	1.00	2.00	2.00	2.00	1.00	1.00
Switzerland	1.00	1.00	1.00	1.00	2.00	2.00
Turkey	1.00	1.00	1.00	1.00	2.00	2.00

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Poland
Age 3 refers to ages 3–5.

Spain
Participation rates are higher than 100 percent because there are more registered pupils than children according to demographic projections from the Organization for Economic Co-operation and Development's INES Project.

United Kingdom
Children in day-care facilities are excluded. Ages are recorded in August rather than in December.

Technical Notes

Calculation of Enrollment Rates
The enrollment rate is calculated by dividing the number of enrollments at a given level of education and in a specified age range, by the whole population in the same age range.

Indicator 3

Notes on Figures and Tables

Czech Republic, Denmark, Hungary, and Norway
See notes to Indicator 1.

Finland, Greece, and Ireland
Figures broken down by single age are estimates.

Greece
Age 21 refers to ages 21 and over.

Spain
Participation rates do not take into account students whose age is unknown (about 3 percent of full-time students enrolled in secondary education).

Sweden and the United States
See notes to Indicator 1.

Technical Notes

Calculation of Full-Time Equivalents
See supplemental note to Indicator 1 for details on the calculation of full-time equivalents.

Calculation of Enrollment Rates
See supplemental note to Indicator 2 for details on the calculation of enrollment rates.

Indicator 4

Notes on Figures and Tables

Australia and Denmark
See notes to Indicator 1.

Belgium
University education corresponds to long tertiary courses and higher education in institutions other than universities; nonuniversity tertiary education corresponds to short courses of higher education.

Czech Republic
Age 19 refers to ages 19 and over, so additional data is collapsed into the 18–21 category.

France
The preparatory classes to the Grandes Ecoles are classified at the university level.

Poland
All ages over 25 are included as age 25.

Russia
Age 24 refers to ages 21–24 and age 29 to ages 25–29.

Technical Notes

Calculation of Full-Time Equivalent Scores
See supplemental note to Indicator 1 for details on the calculation of full-time equivalents.

Calculation of Enrollment Rates
See supplemental note to Indicator 2 for details on the calculation of enrollment rates.

Indicator 5

Notes on Figures and Tables

See notes to Indicator 4.

Technical Notes

Calculation of Full-Time Equivalents
See supplemental note to Indicator 1 for details on the calculation of full-time equivalents.

Calculation of Enrollment Rates
The enrollment rate is calculated by dividing the number of enrollments at a given level of education and in a specified age range by the whole population in the same age range.

Indicator 6

See supplemental notes to Indicator 3.

Indicator 7

Notes on Figures and Tables

In some cases, countries limited assessments by excluding certain student groups, such as those in private schools, schools serving handicapped children, or schools where the language of instruction is different from the primary national language. A description of these limitations follows:

Belgium
Includes schools in French-speaking Belgium only; students instructed in Flemish or German were excluded.

Finland
Swedish-speaking, special education, and laboratory schools were excluded.

France
Private schools were excluded (16 percent of 9-year-olds and 21 percent of 14-year-olds).

East Germany (former)
Students in special schools for the handicapped and institutions for specially talented students were excluded.

West Germany (former)
Students in special schools for the handicapped and nongraded private schools were excluded.

Greece
For 14-year-olds, 1.4 percent in evening schools were excluded.

Hong Kong
International schools, ESF Foundation schools, schools not participating in Secondary School Places Allocation System (SSPA), and schools with class size of less than 20 were excluded.

Hungary
Very small schools in remote areas and ungraded schools were excluded.

Iceland
Schools where there were fewer than five students were excluded. Iceland tested students in all schools, therefore no standard errors were calculated.

Ireland
Private schools and schools with fewer than five students were excluded.

Italy
Non-government schools were excluded.

Norway
Schools for Lapps were excluded.

Spain
Students from schools with fewer than 10 students in the defined grade and from schools where medium of instruction was not Castilian/Spanish were excluded.

Thailand
Laboratory schools and schools controlled by the Department of Fine Arts and Culture were excluded.

United States
Students in eligible schools not capable of taking the test (4.9 percent of each age group) were excluded.

Venezuela
Students attending private rural schools were excluded.

Technical Notes

In the Study of Reading Literacy, 32 countries assessed the reading achievement of students in the grades where most 9- and 14-year-olds were enrolled. See the *Sources* section of this publication for additional information on this study.

The reading literacy scores reported in the indicator tables were scaled using the Rausch procedure. The domain scores for each age group were scaled to a mean of 500 and a standard deviation of 100. The average overall score is the mean of the domain scale scores.

Indicator 8

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas, language groups, or grade levels. A description of these limitations follows:

Canada
Age 9 includes 4 out of 10 provinces, age 13 includes 9 out of 10 provinces.

Israel
Hebrew-speaking schools.

Scotland and the United States
Combined school and student participation rate is below .80 but at least .70; interpret with caution because of possible nonresponse bias.

Soviet Union (former)
Fourteen out of 15 republics; Russian-speaking schools.

Spain
All regions except Cataluña; Spanish-speaking schools.

Switzerland
Fifteen out of 26 cantons.

Technical Notes

The International Assessment of Educational Progress (IAEP) surveyed the mathematics and science performance of 13-year-old students in 20 countries, and 9-year-old students in 14 countries during 1990 through 1991. See the *Sources* section of this publication for additional information on this study.

The mathematics assessment is based on five content areas typically taught in mathematics: (1) numbers and operations; (2) measurement, geometry; (3) data analysis; (4) statistics and probability; and (5) algebra and functions. The science assessment is based on four content areas typically taught in science: (1) life sciences, (2) physical sciences, (3) earth and space sciences, and (4) natural sciences.

Indicator 8 contains mean proficiency scores and standard errors for each population participating in the Second IAEP. Proficiency scores allow the comparison of average proficiency across age groups within and between countries. Mean proficiency scores and standard errors were obtained following a series of different statistical analyses: item parameters estimation using item response theory (IRT), vertical equating of 9- and 13-year-old scales, and plausible values technology for estimation of proficiency distributions.

For more detailed technical information regarding these statistical procedures, please refer to the U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1994*, p. 222.

Indicator 9

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas or language groups. A description of these limitations follows:

Canada
Eight out of 10 provinces

Scotland, Soviet Union (former), Spain, and the United States
See supplemental notes for Indicator 8.

Technical Notes

Nine of the countries participating in the IAEP studies of mathematics and science performance of 13-year-olds also administered a short assessment of geography achievement. See the *Sources* section of this publication for additional information on this study.

Indicator 10

Technical Notes

Below is a description of the three literacy scales in the International Adult Literacy Survey and the tasks required at each proficiency level. This description is taken directly from the Organization for Economic Co-operation and Development and Statistics Canada, *Literacy, Economy, and Society: Results of the first International Adult Literacy Survey*, 1995, pages 30–49.

Prose literacy includes text from newspapers, magazines, and brochures accompanied by one or more questions or directives asking the reader to perform specific tasks. These tasks represent three major aspects of information-processing: locating, integrating, and generating. Locating tasks require the reader to find information in the text based on conditions or features specified in the question or directive. Integrating tasks ask the reader to pull together two or more pieces of information in the text. In the generating tasks, readers must produce a written response by processing information from the text and also by making text-based inferences or drawing on their own background knowledge.

Prose Level 1 (Difficulty values 0–225). Most of the tasks at this level require the reader to locate and match a single piece of information in the text that is identical or synonymous to the information given in the directive. If a plausible incorrect answer is present in the text, it tends not to be near the correct information.

Prose Level 2 (Difficulty values 226–275). Tasks at this level tend to require the reader to locate one or more pieces of information in the text, but several distracters may be present, or low-level inferences may be required. Tasks at this level also begin to ask readers to integrate two or more pieces of information, or to compare and contrast information.

Prose Level 3 (Difficulty values 276–325). Tasks at this level tend to direct readers to search texts to match information that require low-level inferences or that meet specified conditions. Sometimes the reader is required to identify several pieces of information that are located in different sentences or paragraphs rather than in a single sentence. Readers may also be asked to integrate or to compare and contrast information across paragraphs or sections of text.

Prose Level 4 (Difficulty values 326–375). These tasks require readers to perform multiple-feature matching or to provide several responses where the requested information must be identified through text-based inferences. Tasks at this level may also require the reader to integrate or contrast pieces of information, sometimes presented in relatively lengthy texts. Typically, these texts contain more distracting information and the inference that is requested is more abstract.

Prose Level 5 (Difficulty values 376–500). Some tasks at this level require the reader to search for information in dense text that contains a number of plausible distracters. Some require readers to make high-level inferences or use specialized knowledge.

Document literacy involves using materials such as tables, schedules, charts, graphs, maps, and forms. Questions or directives associated with the various document tasks are basically of four types: locating, cycling, integrating, and generating. Locating, integrating, and generating refer to the same skills in document literacy as in prose literacy. Cycling tasks require the reader to locate and match one or more features of information, but differ from locating tasks because they require the reader to engage in a series of feature matches to satisfy conditions given in the question.

Document Level 1 (Difficulty values 0–225). Most of the tasks at this level require the reader to locate a piece of information based on a literal match. Distracting information, if present, is typically located away from the correct answer. Some tasks may direct the reader to enter personal information onto a form.

Document Level 2 (Difficulty values 226–275). Document tasks at this level are a bit more varied. While some still require the reader to match on a single feature, more distracting information may be present or the match may require a low-level inference. Some tasks at this level may require the reader to enter information onto a form or to cycle through information in a document.

Document Level 3 (Difficulty values 276–325). Tasks at this level appear to be most varied. Some require the reader to make literal or synonymous matches, but usually the matches require the reader to take conditional information into account or to match on multiple features of information.

Document Level 4 (Difficulty values 326–375). Tasks at this level, like those in the previous levels, ask the reader to match on multiple features of information, to cycle through documents, and to integrate information; frequently, however, these tasks require the reader to make higher order inferences to arrive at the correct answer. Sometimes conditional information is present in the document, which must be taken into account by the reader.

Document Level 5 (Difficulty values 376–500). Tasks at this level require the reader to search through complex displays of information that contain multiple distracters, to make high-level inferences, process conditional information, or use specialized knowledge.

Quantitative literacy involves using numbers and arithmetic operations to complete a task. These numbers often must be located and extracted from different types of documents that contain similar but irrelevant information, be inferred from printed directions, or undergo multiple operations.

Quantitative Level 1 (Difficulty values 0–225). Although no quantitative tasks used in the International Adult Literacy Survay (IALS) fall below the score value of 225, experience suggests that such tasks would require the reader to perform a single, relatively simple operation (usually addition) for which either the numbers are already entered onto the given document and the operation is stipulated, or the numbers are provided and the operation does not require the reader to borrow.

Quantitative Level 2 (Difficulty values 226–275). Tasks at this level typically require readers to perform a single arithmetic operation (frequently addition or subtraction) using numbers that are easily located in the text or document. The operation to be performed may be easily inferred from the wording of the question or the format of the material (for example, a bank deposit form or an order form).

Quantitative Level 3 (Difficulty values 276–325). Tasks at this level typically require the reader to perform a single operation. However, the operations become more varied—some multiplication and division tasks are found in this level. Sometimes two or more numbers are needed to solve the problem and the numbers are frequently embedded in more complex displays. While semantic relation terms such as "how many" or "calculate the difference" are often used, some of the tasks require the reader to make higher order inferences to determine the appropriate operation.

Quantitative Level 4 (Difficulty values 326–375). With one exception, the tasks at this level require the reader to perform a single arithmetic operation where typically either the quantities or the operation are not easily determined. That is, for most of the tasks at this level, the question or directive does not provide a semantic relation term such as "how many" or "calculate the difference" to help the reader.

Quantitative Level 5 (Difficulty values 376–500). These tasks require readers to perform multiple operations sequentially; they must pull out the features of the problem from the material provided or rely on background knowledge to determine the quantities or operations needed.

Indicator 11

Notes on Figures and Tables

Australia

Estimates are based on self-reported information about the number of years of schooling and the highest diploma or degree obtained.

The data do not refer to the age groups 25 to 64 (or 55–64 in Indicator 12) but to the groups 25–69 (or 55–69) years of age.

The gender differences in educational attainment shown in Indicator AA7 can partly be explained as a result of the method used to allocate individuals to levels of education. In the past, persons who transferred from lower secondary education to apprenticeship programs (mostly male) were classified at the upper secondary level, whereas those who transferred directly to nurse and teacher education (mostly female) were classified at the nonuniversity higher education level. In the new classification system nurse and teacher education are considered as university education. Because a wide age band is examined in 11, 12, and 13, it will take a number of years before the impact of the new classification system is fully reflected in the data.

Austria

Classifications for the upper secondary to graduate school levels of education are based on the highest diploma received; whereas those to the preprimary to lower secondary levels refer to the number of years of schooling obtained. Because of the data structure, nonuniversity higher education graduates are reported at the upper secondary level.

Belgium

Estimates are based on self-reported information about the highest diploma or degree obtained. The data are collected by means of a labor force survey.

Canada

Classifications for the primary to upper secondary school levels is based on the average number of years of schooling; for the higher education levels, it is based on diplomas and degrees actually obtained.

Czechoslovakia

Data refer to the population 25 years of age and over. For the age group 55–64 years in Indicator 12, the data actually refer to the group aged 55 years and over.

Nonuniversity higher education is included in the upper secondary level. One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Finland

Data are derived from the *Register of Completed Education and Degrees*. The register contains information about educational qualifications at the upper secondary to graduate school levels, as attained within the regular school and university system. Adult education and apprenticeship programs are excluded.

France

Classification is based on diplomas for all levels except the preprimary and primary levels. The upper secondary level is very complex as it refers to general, vocational, and professional education. The professional programs in the upper secondary level lead to three separate diplomas. One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Germany

The survey data refer to the populations living in the territory of the former German Democratic Republic (East Germany) as well as in the former territory of the Federal Republic of Germany (West Germany). Only obtained diplomas or degrees are considered in classifying persons in the upper secondary through graduate school levels. The data include 11 percent nonresponse, which was proportionally redistributed across the education levels.

Ireland

Classification to level of education is made by level of certificate. The exception is the preprimary and primary levels, where the number of years of schooling is used. A significant number of people who have completed apprenticeship programs equivalent to upper secondary education are classified at the lower secondary level. Postsecondary vocational courses are classified at the upper secondary level, while postsecondary academic programs are classified as nonuniversity higher education. The proportion of men with upper secondary education is likely to be underestimated due to the classification of a predominantly male population with apprenticeship qualifications at the lower secondary level. One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Netherlands

Classification is based on self-reported information, collected by means of a labor force survey, concerning the highest diploma or degree obtained in regular as well as in adult education.

Senior secondary vocational education is totally classified at the upper secondary level. A new scheme currently under development proposes to classify the 3- and 4-year programs Middlebaar Berueps Orderwijs (MBO) as nonuniversity higher education.

New Zealand

The data do not refer to the age group 45–54 in Indicator 12, but to the group 45–64 years of age. One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Norway

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Portugal

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Sweden

The data are based on the national register of population and educational attainment, which contains information about issued certificates at the higher education levels. Around 20 percent of the classifications at the nonuniversity level and 10 percent at the university and graduate school levels are based on self-reported information. Until 1968, persons who had passed an examination of a general program at the upper secondary level were awarded a diploma. The classification of persons educated at a later date is not based on diplomas but on the completion of the lower or upper secondary levels.

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Switzerland

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

Turkey

Classification is based on the latest diploma or degree obtained. The preprimary level is excluded.

United Kingdom
Data are based on a labor force survey which does not include women older than 60 years of age because the female retirement age is 60. Therefore, the number of women 60–64 years of age and their educational attainment is estimated.

The upper secondary level (defined as beginning at about 14–15 years of age and lasting about three years) is interpreted for the United Kingdom as covering all persons with O level or A level examination passes, or their equivalent. Most vocational qualifications are included in the upper secondary level.

One percent or less of the total is not classified by level. Missing data were proportionally redistributed.

United States
Classification to levels of education is derived from the number of years of schooling completed. Preprimary–primary is 8 or fewer years; lower secondary is between 9 and 11 years; upper secondary is between 12 and 13 years; nonuniversity higher education is between 14 and 15 years; and higher education is 16 or more years schooling completed.

Indicator 12

See supplemental notes to Indicator 11.

Indicator 13

See supplemental notes to Indicator 11 and supplemental tables 2 and 3.

Indicator 15

See supplemental notes to Indicator 11.

Indicator 16

See supplemental notes to Indicator 11.

Supplemental Table 2: Percentage of men and women in the total population 25–64 years of age that has completed a certain highest level of education, by education level, gender, and country: 1992

Country	Preprimary–primary		Lower secondary		Upper secondary		Higher education (nonuniversity)		Higher education	
	M	F	M	F	M	F	M	F	M	F
G–7[1]										
Canada	11	11	18	18	27	33	27	26	17	13
France	24	28	20	24	40	33	5	6	11	9
Germany	(2)	(2)	11	25	61	60	13	7	15	8
Italy	33	41	37	32	23	21	(2)	(2)	7	5
United Kingdom	(2)	(2)	28	41	54	44	5	8	12	7
United States	**7**	**6**	**10**	**10**	**52**	**56**	**6**	**7**	**26**	**21**
Other										
Australia[3]	(2)	(2)	37	57	39	21	11	11	13	11
Austria	(2)	(2)	23	43	69	52	(2)	(2)	12	6
Belgium	25	31	28	25	26	24	9	14	12	7
Czechoslovakia[4]	(2)	(2)	19	35	69	57	(2)	(2)	12	8
Denmark	(2)	(2)	37	46	44	35	5	7	14	13
Finland	(2)	(2)	40	40	40	43	8	8	12	8
Ireland	34	30	27	25	21	29	8	9	10	7
Netherlands	14	19	22	29	40	34	(2)	(2)	24	18
New Zealand	29	35	9	14	41	25	8	17	14	9
Norway	(2)	(2)	20	22	53	55	12	13	15	10
Portugal[4]	76	79	9	8	8	7	1	2	5	5
Spain	58	64	16	16	11	9	4	2	11	9
Sweden	(2)	(2)	32	29	45	46	11	14	12	11
Switzerland	(2)	(2)	13	25	57	63	19	7	11	5
Turkey	73	87	9	4	12	6	(2)	(2)	7	3

[1] Data for Japan not available.

[2] Data included in another category.

[3] 1993 data.

[4] 1991 data.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education Statistics, 1985–1992.

Supplemental Table 3: Percentage of men and women in the total population 25–34 years of age having completed specific levels of education, by highest education level, gender, and country: 1991

Country	Preprimary–primary		Lower secondary		Upper secondary		Higher education (nonuniversity)		Higher education	
	M	F	M	F	M	F	M	F	M	F
G–7[1]										
Canada	4	4	17	14	33	36	30	30	16	16
France	(2)	(2)	32	34	48	43	8	10	12	12
Germany	(2)	(2)	9	14	69	68	9	8	13	11
Italy	8	10	51	47	35	37	(2)	(2)	7	7
United Kingdom	(2)	(2)	18	20	61	60	7	9	14	11
United States	**4**	**4**	**10**	**9**	**57**	**56**	**6**	**8**	**23**	**23**
Other										
Australia[3]	(2)	(2)	37	57	39	21	11	11	13	11
Austria	(2)	(2)	15	27	77	64	(2)	(2)	7	8
Belgium	13	14	30	24	33	33	12	20	13	10
Czechoslovakia[2]	(2)	(2)	11	16	75	72	(2)	(2)	14	12
Denmark	(2)	(2)	32	34	50	45	5	7	13	14
Finland	(2)	(2)	20	16	60	63	8	11	12	10
Ireland	14	14	36	25	30	40	11	12	10	10
Netherlands	9	10	22	23	44	44	(2)	(2)	24	23
New Zealand	24	27	12	18	43	30	7	15	14	11
Norway	2	1	12	9	59	60	14	17	13	12
Portugal[4]	67	64	14	14	12	12	1	3	6	8
Spain	28	29	31	30	19	18	7	5	15	18
Sweden	(2)	(2)	19	15	57	59	15	17	9	9
Switzerland	(2)	(2)	10	15	60	72	18	7	11	6
Turkey	61	79	12	6	19	11	(2)	(2)	7	4

[1] No data available for Japan.

[2] Data included in another category.

[3] 1993 data.

[4] 1991 data.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Education Statistics, 1985–1992.

Indicator 17

Notes on Figures and Tables

Austria, France, and the Netherlands
The self-employed are not included.

Belgium
Belgium's data are based on a survey directed to 4,000 persons. For small groups the sample estimates are sometimes not precise. Net incomes (after taxes) from the survey have been weighted by taking into account differences in tax rates.

France
Incomes refer to the main source of earnings for the employed persons. Incomes from other sources are not included.

Switzerland
Income data and information about labor force status refer to the last month of 1991. No information is available about incomes and labor force status during the whole year.

Indicator 18

See supplemental notes to Indicator 17.

Indicator 19

See supplemental notes to Indicator 11.

Indicator 20

Notes on Figures and Tables

Austria, France, Germany, Spain, and the United States
In cases where two methods are reported for one decision, they are given equal weight in the calculation.

Belgium
Results for public schools at the lower and upper secondary school levels include *commissions locales* in intermediate level 1. Responses for two systems are represented proportional to their enrollment.

Ireland

In cases where two methods are given for a decision at the same educational level, they are given equal weights in the calculation. Further, a joint response was submitted for primary and lower secondary education. In cases where decisionmaking is reported as different for the two levels, they are represented proportional to their enrollment.

Technical Notes

Indicator 20 presents results from a survey conducted in 1992 and 1993 under the auspices of the Organization for Economic Co-operation and Development (OECD) Center for Educational Research and Innovation's International Indicators INES project. The purpose of the survey was to collect information about how education decisions were officially made during the 1991 school year.

The survey form consisted of a list of 35 decisions that are made in education systems and grouped into four areas: a) Planning and Structures; b) Personnel Management; c) Organization of Instruction; and d) Resources. For details of the 35 decisions included in the survey, see OECD, *Education at a Glance: OECD Indicators*, Paris: 1993.

For each decision, persons knowledgeable about the education system were asked to provide two items of information: the level where the decision is made and the decisionmaking mode.

The indicators were calculated to give equal importance to each of the four decision domains. Because there were different numbers of decisions in each domain, each item was weighted by the inverse of the number of responses in its domain. If responses were given for all items, the weights were as follows:

Organization of Instruction	1/8
Structures	1/8
Personnel Management	1/12
Resources	1/7

If a country did not respond to all the items in a domain, the weight was adjusted to match the number of responses provided.

Four levels of decisionmaking were distinguished:

a. The school level, including decisions made by its own governing board, the school principal or head teacher, teachers, parents, and students;

b. Intermediate level 1, the intermediate decisionmaking level that is institutionally closest to the school, usually the local authority (for the United States, this is the District level);

c. Intermediate level 2, the decisionmaking level that is closest to the central government; this may also be a regional agency of the central government (for the United States, this is the State level); and

d. The country level, represented by the central government (e.g., national or federal).

Three modes of decisionmaking were identified:

a. Full autonomy, subject only to the constraint of legislation that is external to the education system or very general;

b. Jointly, or in consultation with another level (joint decisionmaking with actors at the same level was not taken into account); and

c. Freely, but within a framework (binding legislation, regulations or finite options, a budget, etc.) decided at a more central level.

Indicator 21

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas or language groups. A description of these limitations follows.

Canada, Scotland, Spain, and the United States
See supplemental notes for Indicator 8.

Indicator 22

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas or language groups. A description of these limitations follows.

Belgium, Finland, France, Hong Kong, Hungary, Iceland, Ireland, Italy, Spain, and Venezuela
See supplemental notes for Indicator 7.

Denmark
All Danish-speaking schools.

Indonesia
All schools in seven provinces where 75 percent of the population lives.

Singapore
Nongovernment schools were excluded.

Indicator 23

Notes on Figures and Tables

All countries

Schools and students are counted at the preprimary level if they are considered to be in education programs. Generally, programs called "kindergarten" or "nursery school" are included, whereas programs called "daycare" are not.

Special education schools are excluded at the preprimary–secondary level, except where noted, but special education students are included if they attended regular schools.

Vocational/technical colleges are included, but worksite programs, technical training centers, and apprenticeship programs and their students are not. Further education, adult education, and correspondence programs also are excluded, except where noted.

Generally, free-standing art and music schools are excluded at the primary–secondary level (because it is not clear that their students attended these schools exclusively), but included at the higher education level where it is clear that the institutions were free-standing institutions, separate from universities.

Higher education enrollments are headcounts. Thus, part-time students are counted as equivalent to full-time students.

Australia

Special education schools and students are included, as there was not enough information in sources by which to separate them out.

Technical and Further Education (TAFE) schools are considered to be higher education.

Sources: Australian Bureau of Statistics, *Schools Australia*, 1992, Table 2. UNESCO.

Belgium (French Community)

L'enseignment artistique (*ex: academie de musique*) *et l'enseignment de promotion socio-culturelle* excluded.

Source: *Service des Statistiques, L'Enseignement en Chiffres 1990–91*, 1991.

Canada

At elementary–secondary level only, private schools and their students are excluded.

Sources: Canadian Education Statistics Council, *A Statistical Portrait of University-Level Education in Canada* (see particularly Annexes 1, 2, and 3); *A Statistical Portrait of Elementary and Secondary Education in Canada*, 1992, Table 6. UNESCO.

Finland
Students in vocational schools can be secondary or higher education students. The number of vocational schools have been divided here between those two levels of education, then, based on their relative proportion of enrollments: two-thirds secondary and one-third higher education. Apprentices, however, are excluded from the counts.

Source: Statistics Finland, *Education in Finland 1994: Education Statistics and Indicators*, 1994, tables 3.3 and 3.6, pp. 20–24.

France
Includes *France Metropolitaine* only. Most students who might be categorized as special education students in other countries are taught in regular schools in France and counted there.

Excludes classes of the CPGE and STS, which are postsecondary programs of additional preparation for admission to the *grand ecoles* (the CPGE) and technical training (the STS). Classes in these programs are typically conducted in *lycees*. Also excluded are schools and enrollments at *ecoles paramedicales et sociales* (enrollment=70,385) and "*autres etablissements d'enseignment superieur*" (enrollment=103,596), including teacher training schools. Not considering the CPGE and STS, about 82 percent of French higher education students are included here. If one were to classify the CPGE and STS as higher education programs, then about 70 percent of French higher education students are included here.

Higher education institutions and enrollments included here, then, include universities, *ecoles d'ingenieurs, ecoles de commerce, gestion, et comptabilite,* and their students.

Sources: *Ministere de l'Education Nationale et de la Culture, L'Education Nationale en Chiffres*, 1991–92, 1992; *Reperes & References Statistiques sur les Enseignment et la Formation*, 1992, pp. 16–17, 22–23, 26–27, 30–31, 34–35, 50–51, 64–65, 130–131, 138–141. UNESCO.

Germany
Sources: *Der Bundesminister fur Bildung und Wissenschaft, Grund-Und Strucktur Daten*, 1992–93, pp. 44–45, 154–155, 167. UNESCO.

Japan
Special Training Schools, Miscellaneous Schools, and the University of the Air are excluded, but correspondence students at regular higher education institutions are counted. Nonuniversity institutions consist of colleges of technology and junior colleges.

Sources: Ministry of Education, Science and Culture, *Monbusho*, 1989, p. 17. Ellen E. Machiko, *A Study of the Educational System of Japan and a Guide to the Academic Placement of Students in Educational Institutions of the United States*. Washington, D.C.: American Association of Collegiate Registrars and Admissions Officers, 1989. APEC. UNESCO.

Korea
Number of universities includes 298 graduate schools. Miscellaneous Schools are excluded.

Sources: Ministry of Education, *Education in Korea, 1990*, 1991, p. 11.UNESCO.

New Zealand
Includes those students enrolled in preprimary programs at primary schools as well as those in physically separate kindergartens. Excludes subsidized supervised playgroups, childcare services, playcentres, and Kohanga Reo. Includes three primary-level and two secondary-level special education schools.

Sources: Ministry of Education, *Education Statistics of New Zealand*, 1991, Table 1.

Spain
Students and schools involved in the Experimental Postsecondary Education Reform program are excluded. Arts and Language schools and students (primary–secondary level) are excluded.

Sources: *Ministerio de Educacion y Ciencia, Informe Nacional de Educacion*, 1992, Tables 1.2, 1.13, 1.14, and 1.15 on pp. 26, 37, 38. UNESCO.

Taiwan
Supplementary Schools are excluded.

Source: Ministry of Education, Bureau of Statistics, *Education in the Republic of China*, 1992, pp. 33 and 37.

United Kingdom
Includes "non-maintained" independent and direct-grant schools (N=2,488), including a small number of independent special education schools [public sector special education schools (N=1,792) and their students (N=112,600) are excluded]. All "non-maintained" schools here comprise the preprimary–secondary combined category. Includes Open University students counted as part-time students.

Excludes independent nursery schools having less than five pupils of compulsory school age. Excludes further education.

Source: Government Statistical Service, *Education Statistics for the United Kingdom*, 1993, Table A.

United States
Preprimary–primary schools (a.k.a. elementary schools) begin with grade 6 or below and end with no grade higher than 8. Secondary schools category includes schools with no grade lower than 7. Thus, most middle schools (grades 6–8) would be classified as primary, whereas most junior high schools (grades 7–9) would be classified as secondary.

Technical Notes

Problems in comparing the number of schools and their sizes across countries

There exists some variation in how countries count students and schools, and which students and schools they count, that creates problems in comparing school sizes. The variation tends to arise chiefly at the "borderlands" of education.

The borderlands include: preprimary education and daycare; special education; adult education; vocational and technical education; correspondence programs; and private schools. Some countries, for example, simply do not consider private "center-based" daycare to be education. Indeed, in some countries, even public center-based daycare is not managed by education authorities; rather, it is the responsibility of human services departments. Programs outside the purview of the education authorities tend not to have good statistical accounting in data collections managed by public education authorities.

The exact location of each "boundary" between level and types of education also varies from country to country and even within each country. In Canada, for example, vocational/technical students in Quebec who so choose enter vocational/technical college in the 12th grade. In the other Canadian provinces with vocational/technical colleges, entry is at the 13th or the 14th grade. Thus, vocational/technical students in the other provinces spend more time at the upper secondary level. The more time the average student spends in a level of education, the greater will be the number of students at that level. This can affect school size.

In order to improve comparability in the school size statistics, the following decisions have been made with regard to the data:

- Countries are excluded if the exact number of schools and students could not be determined at each level. One must be particularly careful not to double count schools. A typical country education statistical table displays the number of schools and students for each level of education. Not all of the schools listed may be separate, however. The best statistical tables, for the purpose of the construction of this indicator, provide separate counts both for schools that are unique to a level of education and for those that combine levels.
- Programs are excluded if it could not be determined precisely how to allocate students and schools between levels of education. This issue arises particularly with vocational/technical programs, which straddle the secondary and higher education levels in some countries, not wholly in one level or the other.
- Each country's own definition for which grades or age-groups comprise the different levels of education have been accepted, because countries count their students and schools within their own classification systems. It should be remembered, though, that the break point between levels of

education varies across countries and even within countries. Thus, in comparing two countries by a particular level of education, one may actually be comparing two different grade-level groups or age groups.

- Only those programs that each country considers to be "education" programs have been counted. This issue arises particularly with preprimary programs. What one country labels "center-based daycare" might not look any different in practice from what another country labels "nursery school." But it was beyond the scope of this project to investigate the content of preprimary programs across countries in much detail. At one extreme, France runs its *ecoles maternelles* through its education ministry, which enroll *most* children ages 3 through 5, and also enroll many 2-year-olds. At the other extreme, some Canadian and Australian provinces have no programs identified as preprimary education (most other Canadian and Australian provinces provide a year of kindergarten in their elementary schools).

- For similar reasons, worksite programs, technical training centers, and apprentice programs and their students are excluded. Further education, adult education, and correspondence programs also are excluded. Reliable comparable data for such programs would be very difficult to uncover. In many cases, country education authorities would not have them.

- Where possible, free-standing special education schools are excluded, because some countries do not count them as part of their education statistics, whereas others do. Moreover, double-counting could emerge as a problem if students spend part of their time at a regular school and the other part at a special school. One could encounter the same problem with primary–secondary level art and music schools, and for the same reason, they have been excluded as well. Moreover, double-counting could be a problem with apprentice programs if students are counted once at their regular school and then again at their work site.

Comparing the elementary-school model to the preprimary-school model

There exist two basic grade-level structures for the preprimary grades, one that adds preprimary grades onto existing elementary schools, and the other that employs separate preprimary schools. In the elementary-school model, a school system might expand into the preprimary grades by, first, adding a year of kindergarten and then, perhaps, a year of prekindergarten. In the preprimary-school model, a school system might build from scratch or convert existing daycare programs to nursery schools with explicit academic instructional components.

A country's expansion of education into the preprimary years within the elementary-school model has the potential for making larger schools, since existing elementary schools are simply adding new grade levels. A country's expansion of education into the preprimary years within the preprimary-school model has the potential for adding more schools and, probably, reducing average school size, because preprimary (or, nursery) schools tend to be smaller than schools at other levels of education.

Countries in which the elementary-school model predominates include Australia, Canada, and the United States. Countries in which the preprimary-school model predominates include Belgium, France, Japan, Korea, Spain, and the United Kingdom. Other countries—Finland, Germany, New Zealand, and Taiwan—employ a mix of the two models, though the preprimary-school model is more popular in each of them. In Taiwan, the public preprimary programs tend to be attached to public primary schools and, thus, in the elementary-school model. The far more numerous private preprimary programs in Taiwan, however, are separate from primary schools.

Preprimary programs have been included here for two reasons: it is not always possible to separate out preprimary students from elementary-school student counts; and one wouldn't want to separate them out, anyway, because they are students who add to the size of the school. Subtracting them from the school population would give one an inaccurate measure of the size of the school.

Problems in calculating the number and size of higher education institutions: branch campuses

Generally, graduate school students are included in the counts of university students. They would only be counted separately if they studied in schools that were separate.

Exactly what constitutes institutional separateness in higher education, however, is open to dispute. Consider the problem of branch campuses. At what stage of existence does a branch campus become a separate institution? Take, for example, the University of California—one university with several campuses. The two most prominent campuses of the University are at Berkeley (UCal), nominally the main campus, and at Los Angeles (UCLA). Legally, these are two branches of the same university, but in many meaningful ways they function as separate universities.

If one were to count UCal and UCLA as separate universities, however, what of all other University of California programs that happen to be geographically separate, for example, the nuclear weapons research facility at Los Alamos, New Mexico, which has no students, classrooms, or teachers? One could, perhaps, explicitly require that, in order to be classified as a higher education institution, a facility must have students, classrooms, and some full-time professors with offices on site. But, even that definition could suffer some slippage in clarity. Besides, examining the individual characteristics of different countries' many higher education institutions in such detail is beyond the scope of this report.

In this report, then, universities are counted as their countries count them. For the United States' data included here, every 4-year degree-granting higher education institution is counted separately, main and branch campuses alike. (And, UCLA and UCal are counted as two separate universities.)

In most countries universities are single institutions that exist in only one place. Branch campuses, and the comparability problem they portend for this indicator, seem to be largely a U.S. phenomenon. For those who would prefer that branch campuses should be counted separately, the U.S. average school size calculated here will seem too high, but the school sizes for all the other countries would still be comparable.

Problems in calculating the number and size of higher education institutions: headcount versus full-time-equivalent enrollment counts

Another education statistics comparability problem—that of headcount versus full-time-equivalent (FTE) enrollments—presents only a minor problem at the preprimary–secondary level, but could represent a major problem at the higher education level. A headcount enrollment counts every student as one student regardless of the level of participation. Theoretically, a student who takes 1 hour a week of class at a university could be counted as one student just as a full-time student, taking 15 hours a week of class would be. In practice, however, some education authorities impose a minimum participation threshold on the numbers in order to not count the most casual students. All students participating, say, at least half-time, might get counted as students in the head count.

Full-time equivalency would count some or all part-time students not as individual students, but as partial students, their weight in the count determined by the degree of their participation in school. A half-time student would get counted as a 0.5 student rather than 1. A quarter-time student would get counted as a 0.25 student, and so on. FTE counts give a more accurate picture of the size of an institution as it is practically being used.

Full-time-equivalent counts are usually lower than headcounts at the same institution. The two methods of counting would only produce the same number at an institution in which all students were full-time. It is not possible that an FTE count could be higher than a headcount if the same students at the same institution were being counted.

For this indicator, we use headcounts. That is because all but three of the countries for which we have data publish headcounts exclusively. Three countries, however, did publish their numbers of part-time students along with their full-time numbers. Counting the part-time students as 0.5 students, we can calculate an FTE enrollment for these countries, Canada, New Zealand, and the United States. Supplemental Table 4 displays these FTE enrollments for the average higher education institution in each country, next to the equivalent headcount enrollment.

As Supplemental Table 4 shows, using FTE enrollments rather than headcounts does not affect the relative ranking of school sizes across these three countries, but it is conceivable that it could make a difference with a larger sample of countries. Part-time students make up a larger proportion of the student population in the United States than in Canada or New Zealand, for example. The proportion of part-time students in a student population may vary across other countries as well and, so long as it does, the two different accounting methods—headcount and FTE—can produce different school size rankings.

Supplemental Table 4: The average size of higher education institutions, by counting method and country: various years

	Average number of students per institution of higher education...	
Country	...using a headcount enrollment	...using a full-time equivalent enrollment
Canada	3,769	3,063
New Zealand	3,737	3,026
United States	**3,988**	**3,120**

Indicator 24

Notes on Figures and Tables

Canada, Israel, the former Soviet Union, and the United States
See supplemental notes for Indicator 8.

West Germany (former)
See supplemental notes for Indicator 7.

Japan
Monbusho reports the number of hours of instruction per year for Japanese 13-year-olds as 1,050. However, the report states that one hour is equivalent to 50 minutes of instruction. Therefore, to make the Japanese figures comparable to the hours of instruction reported in the International Assessment of Educational Progress for other countries, the number of hours in the Japanese school day was multiplied by a ratio of 50 minutes to 60.

Indicator 25

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas or language groups. A description of these limitations follows.

Canada, Israel, Scotland, the former Soviet Union, Spain, Switzerland, and the United States
See supplemental notes for Indicator 8.

Indicator 26

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas or language groups. A description of these limitations follows.

Canada, Israel, the former Soviet Union, Spain, Switzerland, and the United States
See supplemental notes for Indicator 8.

Indicator 27

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas or language groups. A description of these limitations follows.

Canada, Israel, the former Soviet Union, Spain, Switzerland, and the United States
See supplemental notes for Indicator 8.

Indicator 28

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas or language groups. A description of these limitations follows.

Canada, Israel, the former Soviet Union, Spain, Switzerland, and the United States
See supplemental notes for Indicator 8.

Indicator 29

Notes on Figures and Tables

Austria
Lower secondary education

All schools of general education until grade 9. Special schools for handicapped children are excluded.

Upper secondary education

Included are only general secondary and vocational schools which qualify for university. Excluded are lower vocational schools (48 percent of all schools), and some special school types (7 percent of all schools).

Belgium-Flemish
Lower and upper secondary education

All (state, province/community, and catholic) schools offering comprehensive general or comprehensive technical/arts education.

Belgium-French
Primary education

All (state, province/community, and catholic) schools, except special education (3.7 percent of all students).

Lower secondary education

All (state, province/community, and catholic) schools offering comprehensive general or comprehensive vocational education (technical and arts). Excluded is vocational education (22.8 percent of all students) and special education (3.9 percent of all students).

Upper secondary education

All general secondary and vocational schools, except special education (3.9 percent).

Canada-British Columbia
Primary, lower secondary, and upper secondary education

All schools. For the Principal and Computer Coordinator questionnaires no distinction was made between Population 2 and Population 3.

China
Upper secondary education

All schools in the cities/provinces of Beijing, Shanghai, Xingxiang city (Henon province), Neimong, Guangxi Zhuang autonomous region, Jiling, Anhui, Sichuan, Guangdong provinces.

France
Primary education

All schools except private education (15 percent of students) and special education (less than 0.5 percent of students).

Lower secondary education

All schools except private education (students in "Colleges": 20 percent of all students) and special education.

Upper secondary education

All schools except private education (3 percent of students).

West Germany (former)

Lower and upper secondary education

All schools in nine Bundesländer (58 percent of all students).

Greece

Lower and upper secondary education

All schools except private and evening schools (altogether 4 percent of all students).

Hungary

Upper secondary education

All schools.

India

Upper secondary education

All schools in some districts of Delhi and Uttar Pradesh, Maharashtra, West Bengal, and Tamil Nadu (which are the states with the maximum number of computer using schools (in the regions North, West, East and South respectively). These districts (about 30 percent) have been chosen at random within the states.

Israel

Primary education

All schools except special education (7 percent of all students).

Upper secondary education

All academic schools and technological schools with courses leading to certification. This excludes vocational education as well as independent schools (about 4 percent of all students).

Italy

Primary education

All schools except private schools (8.3 percent of the schools and 7.8 percent of the students).

Lower secondary education

All schools except private schools (9.3 percent of the schools and 4.6 percent of the students).

Upper secondary education

All schools except private schools (25.8 percent of the schools and 12.3 percent of the students).

Japan
Primary and lower secondary education

All schools except special education.

Upper secondary education

All general and vocational schools.

Luxembourg
Lower secondary education

All general and technical secondary schools.

Netherlands
Primary education

All schools except special education.

Lower secondary education

All schools except international transition year, English stream, individual agricultural education, agricultural education and nautical education (5 percent of all students).

Upper secondary education

All general secondary, social nursery, economical/administrative, and technical schools. Excluded are all other vocational schools (about 6.4 percent of all students). Teachers were only sampled from general secondary schools.

New Zealand
Primary education

All schools with students in *standard 4* except the Correspondence School and special education.

Lower secondary education

All schools with students in *form 3*, except the Correspondence School and special education.

Upper secondary education

All schools with students in *form 7*, except the Correspondence School and special education.

Poland
Upper secondary education

All schools.

Portugal
Primary education

All schools in the public school system of the continental territory, except distance education.

Lower and upper secondary education

All schools in the public schools system of the continental territory.

Slovenia
Upper secondary education

All schools.

Switzerland
Lower secondary education

All schools except schools in canton Argau, Geneve, Vaud.

Upper secondary education

All schools except schools in canton Geneve.

United States
The sampling frame included all U.S. schools, public and private, that contained a fourth grade or higher, plus vocational and "alternative" high schools. The frame excluded separate schools for the special education population and also excluded schools that only exist to provide part-day or part-year pull-out classes for students from other schools. Each school was allocated to one or more of three sub-frames, "primary," "lower-secondary," or "upper-secondary," depending on whether it contained a 5th grade, 7th or 8th grade, or 10th, 11th, or 12th grade.

Sixth-grade-only schools were allocated to the primary sub-frame and 9th-grade-only schools to the lower secondary sub-frame.

Indicator 32

Notes on Figures and Tables

All countries
Ages of participating students varied. The desired target populations were all pupils attending school on a full-time basis at the grade levels in which most students were 9 and 14.

Indicator 33

Notes on Figures and Tables

Australia
Calculated figures from OECD, National Accounts; fiscal year runs from July 1991 to June 1992.

Canada, Japan, and the United Kingdom
Calculated figures from OECD, National Accounts; 3/4 (1991) + 1/4 (1992).

Finland
Calculated figures from OECD, National Accounts; fiscal year is 1991.

New Zealand
Calculated figures from OECD, National Accounts; fiscal year runs from April 1991 to March 1992.

Sweden and the United States
Calculated figures from OECD, National Accounts; 1/2 (1991) + 1/2 (1992).

Indicator 34

Technical Note

The following formula was used to calculate the average annual percentage increase in productivity:

$$\textit{Annual percentage increase} = \sqrt[30]{\frac{1991\ \textit{Productivity}}{1961\ \textit{Productivity}}} - 1$$

Indicator 36

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas, language groups, or grade levels. A description of these limitations follow:

Canada, Israel, Scotland, the former Soviet Union, Spain, Switzerland, and the United States
See supplemental notes for Indicator 8.

Indicator 37

Notes on Figures and Tables

In some cases, countries limited assessments to particular geographic areas, language groups, or grade levels. A description of these limitations follow:

Canada, Israel, Scotland, the former Soviet Union, Spain, Switzerland, and the United States
See supplemental notes for Indicator 8.

Indicator 38

Notes on Figures and Tables

Australia
Teachers include principals, deputy principals, and senior teachers mainly involved in administrative tasks.

Denmark
The figures are estimates. Teaching staff at continuation schools are included in other staff.

Japan
Principal and vice principals are included in "Teachers" while other staff is included in Support Staff.

West Germany (former)
Most figures are estimates. The apprentice teachers—i.e., the staff responsible for the teaching of apprentices in the enterprises under the dual system—are not included among the teaching staff.

United Kingdom
Figures on teachers at lower secondary education are included in upper secondary education.

United States
Figures on teachers in early childhood education are included in primary education.

Technical Notes

Calculation of full-time equivalents
See supplemental notes to Indicator 1 for details on the calculation of full-time equivalents.

Indicator 39

Notes on Figures and Tables

Australia, Denmark, Finland, West Germany (former), and the United States
See supplemental note for Indicator 38.

Technical Notes

Calculation of full-time equivalents
See supplemental note for Indicator 1 for an explanation of the calculation of full-time equivalents.

Indicator 41

Notes on Figures and Tables

All countries
The service of public debt is included in total public expenditure.

Because the fiscal year has a different starting date in different countries, within-country Consumer Price Indexes (CPI) were used to adjust the Purchasing Power Parity (PPP) indices to account for inflation.

Australia
Expenditure for higher education includes expenditure for vocational secondary education, as it is taught in institutions of higher education, and are from 1992. Expenditures for preprimary, primary, and secondary and private higher education are from 1991.

Belgium and the Czech Republic
All education expenditure figures are derived from figure for public education expenditure per GDP multiplied by current/total expenditure ratio for total public and private education expenditure.

Canada
Preprimary expenditures are not calculated separately, rather, they are included in primary-secondary and higher education.

Denmark
Expenditure data for publicly supported private schools include capital expenditures.

Finland
Public/private expenditure ratio from 1991 is used to calculate education expenditures.

Public/private ratio reported for "all levels" is used for both primary–secondary and higher education.

West Germany (former)
Includes contributions to the pension funds of teachers who are civil servants.

Expenditure data for publicly supported private schools include capital expenditures.

Italy
All education expenditure figures are derived from figure for public education expenditure per GDP multiplied by current/total expenditure ratio for total public and private education expenditure.

Norway
Expenditure data for publicly supported private schools include capital expenditures.

Total public expenditure figure is from 1990–91.

Sweden
Calculated figures from OECD, National Accounts; 1/2 (1991) + 1/2 (1992).

All expenditure figures include capital expenditures.

Switzerland
All education expenditure figures are derived from figure for public education expenditures per GDP, multiplied by current/total expenditure ratio for total public and private education expenditure.

Expenditure data for publicly supported private schools include capital expenditures.

Education expenditure data include only net expenditures for ancillary services.

United Kingdom
All education expenditure figures are derived from figure for public education expenditure per GDP, multiplied by current/total expenditure ratio for total public and private education expenditure.

Excludes expenditure on nursing and paramedical education.

Technical Notes

Methodology used for adjusting inflation rates

Although most countries report education expenditure for the calendar year (CY) 1992, eight countries have provided figures for financial years starting in April, June, or other months of 1991. Because of price inflation, the expenditure figures of the latter countries are not strictly comparable to those of countries that report for January–December 1992. For example, if a country with a 6 percent annual inflation rate submits expenditure figures for the financial year July 1991 to June 1992, that country's outlays will be about 3 percent less, simply because of inflation over a 6-month period, than if the same country had provided data for CY 1992. For this reason, it is important to adjust the figures of the countries that do not report by calendar year to correct for inflation. Such adjustments affect finance indicators 41, 42, and 43. The remaining finance indicators 44 and 45, are not affected because they consist of ratios in which the numerators and denominators already pertain to the same period.

Indicators 41 and 42 compare educational expenditures with variables that normally are reported for CY 1992—namely, GDP in the case of indicator 42 and total public expenditure for all purposes in the case of indicator 41. To make the numerators and denominators of these indicators compatible, it is necessary to adjust the expenditure figures of countries that have not reported educational spending for the 1992 calendar year. The required adjustment is:

$$EXP_{ADJ} = EXP\ (1 + INF)$$

where EXP and EXP_{ADJ} are unadjusted and adjusted expenditures, respectively, and INF is the inflation rate for the number of months between the country's financial year and CY 1992. For example, if the country's fiscal year begins in July 1991, INF would be the inflation rate during a 6-month period, or one-half the annual inflation rate between 1991 and 1992.

An exception to this procedure applies to two countries, Australia and New Zealand, for which national accounts data, including GSP and total public expenditure, are not reported by calendar year. For these two countries only, the educational expenditure figures have been adjusted to correspond to the year for which GDP is reported rather than to CY 1992.

Two limitations of these adjustment procedures should be recognized. First, the adjustments are for changes in the general (GDP) price level but not in the price level for education. No suitable purchasing power parity (PPP) figures are available that pertain specifically to education. Second, no allowance has been made for real growth in educational expenditure (increases in excess of inflation) that might have taken place during the 6-month or 9-month periods covered by the adjustments. It would only be possible to take real growth into account retroactively, after data for the 1992–93 financial year become available. Nevertheless, the adjustment for inflation does eliminate one significant source of noncomparability of expenditure figures, thereby enhancing the validity of the international comparisons of educational spending.

Indicator 42

Notes on Figures and Tables

All countries
Gross domestic product is gross national product less net property income from abroad.

Australia
Expenditures for higher education include expenditures for vocational secondary education, as it is taught in institutions of higher education, and are from 1991–92. Expenditures for preprimary, primary–secondary, and private higher education are from 1990–91 (in 1991–92 constant dollars).

Austria, Belgium, the Czech Republic, and Italy
All expenditure figures are derived from figure for public education expenditure per GDP, multiplied by current/total expenditure ratio for total public and private education expenditure.

Belgium
Research expenditures are included to the extent that they are covered by funds provided by the community education authorities. Research funds from other public and private sources are excluded.

Canada
Preprimary expenditures are not calculated separately; rather, they are included in primary–secondary expenditures.

Denmark and Norway
Expenditure data for publicly supported private schools include capital expenditures.

Finland
Public/private expenditure ratio from 1991 is used.

Public/private ratio reported for "all levels" is used for both primary–secondary and higher education.

The percentage is affected by the decline in GDP between 1990 and 1992. Expenditure for "not allocated by level" includes expenditure for adult education and educational expenditure from the Ministry of Education and the National Board of Education. Research expenditure includes general university and business enterprise funds but not other separately identified R&D funds.

West Germany (former)
Expenditure data for publicly supported private schools include capital expenditures and contributions to the pension funds of teachers who are civil servants. Total educational expenditures are not complete. The following expenditures are missing: private schools (however, public grants given to private schools are included); schools for nurses; agricultural training and research centers: German Research Foundation; Federal Institute for Employment (expenditure for retraining, better qualification, etc.); training of apprentices in the public service; support payments for dependent children made to persons undergoing education/training; allowances paid to teachers enjoying the status of public official for medical treatment and health insurance; scholarships granted by private institutions; households' purchases of commodities and services for education.

Public expenditures broken down by level of education and by type of expenditure are estimates.

Almost all expenditure on research is included: there are some minor omissions.

Ireland
Expenditure includes mainstream higher education research.

Expenditures of private entities other than households are underestimated because they are only provided for higher education. The expenditures for the other levels of education are not available.

Japan
All separately identifiable research expenditure has not been taken into account but compensation of teaching staff (and other regular staff) in universities is included.

New Zealand
Education expenditures represent total public expenditure (i.e., include capital expenditure and debt service) and are derived from public education expenditure per GDP figure.

Norway
Expenditures for preprimary education in government-dependent institutions (their amount is small) are included in expenditures for primary education.

Spain
Public expenditure for education is underestimated because a large part of the pension costs are not included.

Payments to independent private institutions for higher education are underestimated because only the payments of private entities to universities for their activities of research and development are included.

Expenditure on research has been partly taken into account. Some higher education institutions have all R&D expenditure in their budgets; others have only general university funds and certain types of contracts.

Sweden
Preprimary and higher education figures include capital expenditures.

Switzerland
All expenditure figures are derived from figure for public education expenditure per GDP multiplied by current/total expenditure ratio for total public and private education expenditures.

Expenditure data for publicly supported private schools include capital expenditures.

Expenditure data include only net expenditures for ancillary services.

United Kingdom
All expenditure figures are derived from figure for public education expenditure per GDP multiplied by current/total expenditure ratio for total public and private education expenditures.

Excludes expenditure on nursing and paramedical education.

Expenditure by or on behalf of independent institutions at the higher education level has been assumed to be negligible.

Only general university funds and grants from the Department of Education are included. All other separate R&D funds have not been taken into account.

United States
All research expenditures are included except for funds on major university-administered federal R&D centers.

Technical Notes

This indicator does not give a complete picture of the distribution of public resources between the three levels, since some countries did not classify portions of their public expenditures, reporting them, instead, as "undistributed."

The indicator is also influenced by the duration of each level in different countries. For example, if primary education lasts 4 years in one country and 6 years in another, we would expect the primary share of GDP funding to be roughly 1.5 times as large in the latter country, other things being equal.

Countries sometimes designate different level classifications to a particular type of education program. This is particularly true of certain types of vocational and technical education, which are considered secondary education in some countries and higher education in others.

Some countries' expenditures for higher education include substantial public subsidies for student living expenses, whereas other countries' expenditures do not. Also, the higher education expenditures of some countries include the full costs of research conducted at higher education institutions, while the figures of other countries include only selected portions of research outlay.

Methodology Used for Adjusting Inflation Rates
See supplemental notes for Indicator 41.

Indicator 43

Notes on Figures and Tables

Austria
Seventy percent of full-time apprentices have been excluded from the total number of full-time equivalent enrollments. Subtracting this percentage that represents training in firms was required to adjust the figures to data on expenditure because figures on firms' expenditure were not available. It was assumed that apprentices spend about 30 percent of their training in public schools and 70 percent with the employers (these are approximate figures).

Canada
At the higher education level, for public institutions, expenditures are net of ancillary services.

Czech Republic
Costs per student cannot be calculated by distinguishing expenditures for primary and secondary levels because the data for lower secondary education have been included in primary and not in upper secondary education.

Data on expenditures for nonuniversity higher education have been included in expenditures for upper secondary education but these expenditures are small.

Denmark
Because adult education is included in the expenditure, the following figures for full-time equivalent enrollment have been used to calculate the participation indicators:

Lower secondary education:	12,000
Upper secondary education:	21,000
Higher education:	15,000

Japan
Figures on expenditure by type of institution do not include expenditure for textbooks and scholarships.

Sweden
Enrollments and expenditure for adult education have not been taken into account.

Switzerland
Costs per student in secondary education and in primary–secondary education have not been calculated because figures on apprentices and vocational education students do not correspond to the figures for expenditure at this level.

For additional details on individual countries, see supplemental note for Indicator 42.

Technical Notes

Calculation of full-time equivalent enrollment

Enrollment is in all institutions, public and private, and is based on headcount estimates for preprimary through secondary education. For higher education, it is full-time equivalent enrollment.

Methodology used for adjusting inflation rates

Indicator 43 shows expenditure per student expressed in equivalent US dollars, converted at PPP rates. In cases where countries have reported expenditures for CY 1991, the calculation is simply Indicator 43 = (EXP/ENR)PPP_{91} where EXP/ENR is expenditure per student in units of national currency and PPP_{91} is the PPP exchange rate between 1992 units of national currency and 1992 US dollars. In cases where countries' fiscal years begin in 1991, however, this formula has to be adjusted to reflect inflation between 1991 and 1992. The adjusted formula, reflected in the tables for indicator 43, is

$$\text{Indicator } 43 = (EXP/ENR)/PPP_{ADJ}$$

where the adjusted PPP rate, PPP is calculated as a weighted average of the PPPs applicable to 1991 and 1992 according to the equation,

$$PPP_{ADJ} = W_{91}(PPP_{91}) / (1 + r_{US}) + W_{92}(PPP_{92}).$$

In this expression, PPP_{90} is the PPP exchange rate between 1991 units of national currency and 1991 US dollars, r_{US} is the United States inflation rate between 1991 and 1992, and W_{91} and W_{92} are the weights applicable to 1991 and 1992, based on the starting and ending months of the country's school year. For example, $W_{91} = 0.75$ and $W_{92} = 0.25$ for a country with a financial year April 1991 to March 1992, but $W_{91} = 0.50$ and $W_{92} = 0.50$ for a country with a financial year July 1991 to June 1992).

Private expenditures
Per pupil expenditure is calculated as current public expenditure divided by enrollment in both public and private schools. Because it does not include investment from private sources, it is not a measure of the total resources students receive.

Purchasing Power Parity (PPP) index
A Purchasing Power Parity (PPP) index for Gross Domestic Product (GDP) was used in this indicator. PPP indices are calculated by comparing the cost of a fixed market basket of goods and services (e.g., living expenses, such as housing and food) in each country. This market basket of goods and services does not include educational expenses. Thus, in countries where the cost of education is higher relative to that of the living expenses reflected in a PPP, the PPP may underestimate the cost of education.

Indicator 44

Notes on Figures and Tables

Australia
Expenditure for higher education includes expenditure for vocational secondary education, as it is taught in institutions of higher education, and are from 1991–92. Expenditures for preprimary and secondary education and private higher education are from 1990–91.

Austria, Belgium, Czech Republic, Switzerland, and the United Kingdom
Expenditures represent total public expenditure (i.e., include capital expenditure and debt services) and are derived from public education expenditure per GDP figure.

Austria and the Czech Republic
See supplemental note for Indicator 43.

Canada
Expenditure for preprimary education is included in expenditure for primary and secondary education.

Denmark
Expenditure data for publicly supported private schools include capital expenditures.

Finland
Public education expenditures are derived from total education expenditure figure, using a public/private ratio from 1991.

Public/private ratio reported for "all levels" is used for both primary-secondary and higher education.

Figures include daycare and preschool education (and meals) provided for 3–6-year-olds, in daycare centers, generally 8 to 10 hours a day, 5 days a week.

West Germany (former)

Includes contributions to the pension funds of teachers who are civil servants.

Expenditure data for publicly supported private schools include capital expenditures.

For preprimary, primary, and secondary levels, figures refer to public institutions only.

For higher education shares of enrollments have not been calculated because enrollments cannot be distinguished between public and private institutions.

New Zealand

All expenditure figures are derived from figure for public education expenditure per GDP, multiplied by current/total expenditure ratio for total public and private education expenditures.

Norway

Expenditure data for publicly supported private schools include capital expenditures.

Spain

Public expenditure for education is underestimated because a large part of the pension costs is not included.

Sweden

Preprimary and higher education figures include capital expenditures.

Switzerland

Expenditure data for publicly supported private schools include capital expenditures.

Expenditure data include only net expenditures for ancillary services.

United Kingdom

Excludes expenditure on nursing and paramedical education.

Indicator 45

Notes on Figures and Tables

Austria, Belgium, the Czech Republic, West Germany (former), Hungary, Ireland, Italy, Norway, and Switzerland
Public-private proportions are derived from expenditure-per-GDP table F01 in the Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, Internation Indicators Project, 1995.

Belgium
Provincial or regional sources refer to the expenditures from the three communities; local or municipality sources refer to the expenditures from provinces and cities.

Figures on central funds are available for all levels of education combined but they cannot be broken down by level of education.

Canada
Expenditure for preprimary education is included in expenditure for primary and secondary education.

Denmark, Ireland, and Spain
The country mean for the three levels of governments may not add up to 100 percent, since they do not include certain percentages of funds from international sources.

European Community countries
European Community (EC) member countries can receive funds from the EC Social Fund for vocational education in the upper secondary through graduate school levels. Ireland is the only country that reported these funds to the Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, International Indicators Project, 1995.

Finland
Data concerning households and private organizations are available.

West Germany (former)
Expenditures by regional governments include subsidies from the federal government. The private share of primary and secondary expenditure is influenced by the inclusion of large outlays by private firms for training and compensating apprentices under the dual system. Other countries with similar systems have not included such outlays in their educational expenditure figures.

Hungary
There are regional governments (counties) and municipalities as well but it is preferable to regard both as local governments because regional governments have no significant redistributive role.

Japan
Expenditure of prefectures and municipalities cannot be provided separately.

Switzerland
See supplemental notes for Indicator 42.

United Kingdom
Expenditure by or on behalf of independent institutions at the higher education level has been assumed to be negligible.

Only general university funds and grants from the Department of Education are included. All other separate R&D funds have not been taken into account.

SOURCES OF DATA

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SOURCES OF DATA

The information presented in this report was obtained from many sources, including federal, national, international, and state agencies, private research organizations, and professional associations. The data were collected using many research methods, including surveys of a universe (such as all colleges) or of a sample (such as 15,000 eighth graders), and compilations of administrative records. In the *Sources of Data* section, descriptions of information sources and data collection methods are presented, grouped by sponsoring organization. More extensive documentation of a particular survey's procedures does not imply more problems with the data, only that more information is available.

The accuracy of any statistic is determined by the joint effects of "sampling" and "nonsampling" errors. Estimates based on a sample will differ somewhat from the figures that would have been obtained if a complete census had been taken using the same survey instruments, instructions, and procedures. Estimation of sampling error is discussed in the sidebar entitled *Using data from sample surveys*. Unless otherwise noted, all statements, cited in the text from sample surveys were tested for statistical significance and are statistically significant at the .05 level. Several test procedures were used. Which procedure was used depended on the type of data being interpreted and the nature of the statement being tested. The most commonly used procedure was multiple *t*-tests with a Bonferroni adjustment to the significance level. When multiple comparisons between more than two countries were made, even if only one comparison is cited in the text, a Bonferroni adjustment to the significance level was made to ensure the significance level for the tests as a group was at the .05 level. In this report the emphasis is on comparisons between the United States and the other G-7 countries which required adjusting the significance level for the number of other countries represented in the table.

In addition to sampling errors, all surveys—both universe and sample—are subject to nonsampling errors. These arise, for example, when the respondents or interviewers interpret questions differently, when respondents fail to respond (completely or partially), or when respondents who should be included in a universe are not. Since estimating the magnitude of nonsampling errors often would require special experiments or access to independent data, these nonsampling errors are seldom available. Thus, estimates of survey error in statistics usually, but not always understate total survey error and overstate the precision of survey estimates.

Readers should take particular care when comparing data from different sources. Differences in procedures, timing, phrasing of questions, and interviewer training mean that the results from the different sources may not be strictly comparable. Readers should also be aware that countries are at different stages in the sophistication of their data development and collection systems, and thus, have different types of data in an easily accessible form.

A limited number of countries (e.g., Denmark, Switzerland) have national registers that follow student cohorts throughout their education career. Some countries (e.g., United States, Canada) have large survey programs that collect data regarding education based on samples of schools or students. Additionally, some countries have extensive national-level data available through administrative records.

Center for Educational Research and Innovation Organization for Economic Co-operation and Development

Education at a Glance: OECD Indicators

The third edition of *Education at a Glance* (EAG), published in 1995, is produced through the cooperation of member countries of the Organization for Economic Co-operation and Development (OECD) and the Indicators of Education Systems (INES) project. 1991–1992 data for 49 indicators of international education are provided for 27 nations—Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany (Unified, former West and former East Germany, as available), Greece, Hungary, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Russia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. Indicators cover the contexts of education (i.e., demographic, social and economic, opinions and expectations); costs, resources, and school processes; and student, system, and labor market outcomes of education. Much of the data is broken down by education level. EAG, 1995 also provides annotated organization charts of the countries' education systems.

Most of the OECD data used in *Education Indicators: An International Perspective* came from *Education at a Glance* (EAG), 1995, which reports data for 1992. In the few cases where 1992 data are not available, earlier versions of EAG were used.

Since only developed nations, mostly European, are included in OECD studies, the range of analysis is limited. However, OECD data allow for some detailed international comparisons of financial resources or other education variables to be made for this selected group of countries.

The International Assessment of Educational Progress (IAEP)

In 1990–91, a total of 20 countries assessed the mathematics and science achievement of 13-year-old students and 14 of the 20 countries assessed 9-year-old students in these same subjects. Nine of the countries participating in the evaluation of 13-year-olds also administered a geography component. Some countries assessed virtually all age-eligible children in the appropriate age group; others confined their samples to certain geographic regions, language groups, or grade levels. The definition of populations often followed the structure of school systems, political divisions, and cultural distinctions. In some countries, significant proportions of age-eligible children were not represented because they did not attend school. Also, in some countries, low rates of school or student participation mean results may be biased.

Typically, a random sample of 3,300 students from about 110 different schools was selected from each population at each age level; half were assessed in mathematics and half in science. A total of about 175,000 9- and 13-year-olds (those born in calendar years 1981 and 1977, respectively) were tested in 13 different languages in March 1991.

The mathematics and science achievement tests lasted 1 hour. The tests given to 9-year-olds included 62 questions in mathematics and 60 questions in science. Those for 13-year-olds included 76 questions in mathematics and 72 questions in science. In addition, students of each age group spent about 10 minutes responding to questions about their backgrounds and home and school experiences. School administrators completed a school questionnaire. The geography component consisted of 24 content-area questions and 14 background questions.

Initial analyses involved the calculation of the percentage of correct answers and standard errors for individual questions. For each population, the weighted percentage of correct answers was calculated for each question. The results of students who omitted questions at the ends of sections because they didn't reach them were excluded from the calculations for those questions. For each percentage correct, an estimate of its standard error was calculated using the jackknife procedure. Percentage and standard errors were calculated for subgroups within each population, including gender and grade. Statistics for Canada were calculated using an appropriately weighted sample of responses drawn from the individual Canadian populations. Results of the mathematics, science, and geography assessments can be found in three separate publications produced by IAEP and Educational Testing Service (ETS), entitled *Learning Mathematics*, *Learning Science*, and *Learning About the World*.

International Association for the Evaluation of Educational Achievement (IEA)

Reading Literacy Study

In the period 1989 to 1992, the International Association for the Evaluation of Educational Achievement (IEA) conducted a Reading Literacy Study in 32 systems of education. The study focused on two levels in each of these systems, the grade level where most 9-year-olds were to be found and the grade level where most 14-year-olds were to be found.

To obtain comparable samples of students, multistage sampling was used in each country and schools or classes were typically drawn with a probability proportional to the size of the school or class.

Three major domains or types of reading literacy materials assessed at both age levels were as follows:

1. *Narrative prose:* Continuous texts in which the writer's aim is to tell a story—whether fact or fiction. They normally follow a linear time sequence and are usually intended to entertain or involve the reader emotionally. The selected extracts ranged from short fables to lengthy stories of more than 1,000 words.
2. *Expository prose:* Continuous texts designed to describe, explain, or otherwise convey factual information or opinion to the reader. The tests contained, for example, brief family letters and descriptions of animals as well as lengthy treatises on smoking and lasers.
3. *Documents:* Structured information presented in the form of charts, tables, maps, graphs, lists, or sets of instructions. These materials were organized in such a way that students had to search, locate, and process selected facts rather than read every word of continuous text. In some cases, students were required to follow detailed instructions in responding to such documents.

To obtain raw scores, all correct answers were totaled for each student in each domain. The Rausch procedure was used to produce scales for each domain. Each scale was given a mean of 500 and a standard deviation of 100.

Computers in Education Study

The Computers in Education (Comped) study, conducted by the IEA, was designed to evaluate how computers have been introduced in education and are being used in schools around the world. Data from 21 school systems in the following 20 countries were included in the study: Austria, Belgium (Flemish and French schools evaluated separately), Canada, China, France, West Germany (former), Greece, Hungary, India, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Poland, Portugal, Slovenia, Switzerland, and the United States. Data collection for the first part of the two-stage study was completed in 1989, and data collection for the second stage was conducted in 1992. The aim of stage 1—to collect data at the national, school, and teacher level focusing on how computers are used, the extent and availability of computers in schools, the nature of instruction about computers, and estimates of the effects that computers have on students—was achieved through the completion of school and teacher questionnaires. The analysis of stage 1 data is presented in the IEA publication entitled *The IEA Study of Computers in Education: Implementation of an Innovation in 21 Education Systems.* Stage 2 of the study consists of two parts: the first part is a follow-up of stage 1, to assess longitudinal change, and the second part involves evaluating effects of school variables, teacher, and teaching variables on student outcomes in the domain of computer usage in schools.

Luxembourg Income Study

The Luxembourg Income Study (LIS) began in 1983 as a joint project sponsored by the government of Luxembourg and the Center for Population, Poverty and Policy Studies (CEPS) in Walferdange, Luxembourg. Created to compile and provide access to an international database containing social and economic data, the project receives its current funding from CEPS/International Networks for Studies in Technology, Environment, Alternatives, Development (INSTEAD) and the national science foundations of its member nations. Along with its office in Walferdange, divisions of LIS are housed at Syracuse and Harvard Universities.

As of 1993, LIS membership consisted of 23 countries in Europe, North America, and Australia, with applications pending for Korea, Finland, Mexico, Portugal, and Taiwan. Data are provided by individual nations and cover the period from 1968 to 1989. Each study conducted by LIS is produced in the form of a working paper, of which there are more than 100. LIS reports are also published in books, articles, and dissertations.

Bureau of the Census
U.S. Department of Commerce

Statistical Abstract of the United States

First published in 1878, the *Statistical Abstract of the United States* is an annual publication containing statistics on finance, education, industry, health, and population for the United States. Although it primarily presents national data for the United States, each volume contains some data at the state, regional, and metropolitan level. Current volumes also include a small section on international comparative statistics. Most of the data used in the publication is taken from the household survey information of the U.S. Census. Other data is provided predominantly by other divisions of the U.S. Department of Commerce and by other government agencies.

Bureau of Labor Statistics
U.S. Department of Commerce

Office of Productivity and Technology

The Office of Productivity and Technology's unpublished tables entitled "Comparative Real Gross Domestic Product Per Capita and Per Employed Person" present national data for 13 OECD countries and Korea. The tables provide two sets of comparisons, based on purchasing power parities (PPPs) benchmarked to 1985 and 1990 studies. The studies were conducted jointly by the OECD and EUROSTAT (the Statistical Office of the European Community) as part of the United Nations International Comparison Project (UNICP). Information for each benchmarked year includes data for GDP, GDP per capita, and GDP per employed per person, indexed to the United States and in U.S. dollars. PPPs and relative prices are also given, with PPPs for GDP and comparative price levels indexed to the United States. The tables also present GDP trends, implicit price deflators for GDP, and population and employment measures.

Results of the 1985 and 1990 studies differ dramatically; this is most likely attributed to weighing patterns, the change in aggregation method, or possible measurement errors.

GLOSSARY

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GLOSSARY

Abitur: Germany's secondary school leaving certificate.

Achievement test: An examination that measures the extent to which a person has acquired certain information or mastered certain skills, usually as a result of specific instruction.

American College Testing Program (ACT): The ACT assessment program measures educational development and readiness to pursue college-level coursework in English, mathematics, natural science, and social studies. Student performance on the tests does not reflect innate ability and is influenced by a student's educational preparedness.

Apprenticeship: In calculating the indicators, youth apprenticeship programs are classified as belonging to formal education. Such programs typically involve an alternation between learning in an educational institution (ordinary or specialized) and learning through work experience programs, which may include highly organized training in a firm or with a craftsperson. The apprentices and the firm (or craftsperson) are bound by a legal agreement. Even though only a part of the training occurs in schools, it is considered as a full-time activity, because it covers both theoretical and practical training. Apprenticeship programs are classified as technical or vocational programs in upper secondary education.

Baccalauréat: French exit examination from *lycée*, and the university entrance examination.

Bachelor's degree: A degree granted for the successful completion of a baccalaureate program of studies, usually requiring at least 4 years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work-study program.

CAP (Certificat d'Aptitude au Professionelle): France's Certificate of Vocational Qualification. It is earned from technical schools (upper secondary).

CAPES (Certificat d'Aptitude au Professorat de l'Enseignement Secondaire): France's Certificate of Qualification to Teach Secondary Education.

Center for Educational Research and Innovation (CERI): The CERI is an organization within OECD that promotes and conducts cooperative educational research activities among the OECD member nations.

Class size: The number of students faced by each teacher during a period of instruction.

Cohort: A group of individuals who have a statistical factor in common, for example, year of birth.

Comprehensive schools: Schools that offer a general curriculum, rather than a curriculum intended to prepare students for specific occupations, types of higher education, or training. In most cases, students within a comprehensive school may choose courses that serve such a purpose, but comprehensive schools as a whole serve students with a variety of career and educational plans. (See *Differentiated schools*.)

Compulsory education: Education mandated by law.

Confidence interval: An interval of values within which there is a specified probability that the true value lies. For example, in the case of a 95 percent confidence interval, there is a 95 percent probability that the true value lies within the interval.

Constant dollars: Dollar amounts that have been adjusted by means of price and cost indexes to eliminate inflationary factors and allow direct comparison across years.

Consumer price index (CPI): This price index measures the average change in the cost of a fixed market basket of goods and services purchased by consumers.

Current dollars: Dollar amounts that have not been adjusted to compensate for inflation.

Current expenditures: These expenditures represent educational goods and services whose lifespan should not, in theory, exceed the current year, such as salaries of staff, educational supplies, scholarships, minor repairs and maintenance, and administration. Conventionally, minor items of equipment are treated as current expenditure, even if the corresponding physical asset lasts longer than one year. Current expenditures exclude *capital expenditures*, which are for assets that will be used for many consecutive years, such as buildings, major repairs, major items of equipment, and vehicles, even if the financing of such assets is reported in a single financial year.

Current expenditures per student: Current expenditure for the regular school term divided by the total number of students registered in a given school unit at a given time, generally in the fall of a year.

Differentiated schools: Schools offering a particular type of curriculum, such as college preparatory or vocational. For example, secondary school students in Germany enroll in differentiated schools, including those that prepare them to enter apprenticeship programs or those that prepare them for university education.

Diplôme d'Études Universitaires Générales (DEUG): France's Diploma of General University Studies, generally earned after the first 2 years of university.

Dual system: A system of apprenticeship which combines part-time study with part-time work in a specific occupational field, such as the one found in Germany.

Ecoles Maternelles: Nursery schools in France.

Education at a Glance (EAG): This publication came out of CERI's (see CERI) International Indicators Project, initiated in response to the demand for comparative information on education in the OECD member nations. The project develops and reports on indicators of participation, attainment, finance, learning outcomes, education and the labor market, the functioning of schools and school systems, and attitudes toward education. The first volume of EAG was published in 1992; subsequent volumes are being published on a regular basis.

Educational attainment: The highest grade, year, or level of regular school attended and completed.

Educational expenditures: The sum of expenditures on instruction, research, public service, academic support, student services, institutional support, operation and maintenance of plant, and awards from restricted and unrestricted funds.

Employed: Includes civilian, noninstitutional persons who (1) worked during any part of the week in which data were collected as paid employees; worked in their own business, profession, or farm; or worked 15 hours or more as unpaid workers in a family-owned enterprise; or (2) were not working but had jobs or businesses from which they were temporarily absent due to illness, bad weather, vacation, labor-management dispute, or personal reasons whether or not they were seeking another job.

Engineering and engineering technologies: Instructional programs that focus on the application of the mathematical and the natural sciences for practical purposes (i.e., to develop ways to utilize the materials and forces of nature economically). Include programs that prepare individuals to support and assist engineers and similar professionals.

Enrollment: The total number of students registered in a given school unit at a given time, generally in the fall of a year.

Enrollment rate: This rate is calculated by dividing the number of enrollments at a given level of education and at a specified age range by the whole population in the same age range.

Esame di licenza: Italy's exit examination from lower secondary school and entrance examination to upper secondary school.

Esami di maturita: Italy's university entrance examination. It is being implemented on an experimental basis.

Fiscal year: The yearly accounting period for the federal government, which begins on October 1 and ends on the following September 30. The fiscal year is designated by the calendar year in which it ends; for example, fiscal year 1992 begins on October 1, 1991, and ends on September 30, 1992. (From fiscal year 1844 through fiscal year 1976, the fiscal year began on July 1 and ended on the following June 30.)

Full-time/Part-time enrollment: Students are enrolled full-time if they attend a program that is classified as such by the institution. Otherwise, they are considered part-time students. In the United States, higher education students are enrolled full-time if their total credit load is equal to at least 75 percent of the normal full-time course load. In some countries, no distinction is made between full-time and part-time students at certain levels.

Full-time-equivalent (FTE) enrollment: For institutions of higher education, the enrollment of full-time students, plus the full-time equivalent of part-time students as reported by institutions equals the FTE. In the absence of an equivalent reported by an institution, the FTE enrollment is estimated by adding one-third of part-time enrollment to full-time enrollment.

G–7 countries: See *Group of Seven*.

Graduate: An individual who has received formal recognition for the successful completion of a prescribed program of studies.

Graduation: Formal recognition given an individual for the successful completion of a prescribed program of studies.

Gross domestic product (GDP): The GDP is equal to the total of the gross expenditure on the final uses of the domestic supply of goods and services valued at price to the purchaser minus the imports of goods and services.

GDP per capita: The GDP of a country divided by its total population yields per capita GDP.

Group of Seven (G–7): This group is composed of seven industrialized nations with large economies: Canada, France, Italy, Japan, the United States, the United Kingdom, and Germany. Those countries are, coincidentally, all members of the OECD. *However, the G–7 and the OECD are not related organizations.*

Grundschüle: Primary school in Germany; generally includes grades 1–4.

Gymnasium: The German secondary school, graduation from which is a prerequisite for study at a university. It includes grades 5–13.

Hauptschüle: The German general secondary school providing full-time compulsory education in grades 5–9 for students not planning to enter higher education.

High school: A secondary school offering the final years of high school work necessary for graduation, usually including grades 10, 11, 12 (in a 6-3-3 plan) or grades 9, 10, 11, and 12 (in a 6-2-4 plan).

Higher education: This form of education includes study beyond secondary school at an institution that offers programs terminating in an associate, baccalaureate, or higher degree, or equivalent degrees in other countries.

Hoikuen: Japanese daycare centers for the children of working mothers.

Income: Includes all forms of income plus food stamps and similar benefits in other nations, minus federal income and payroll taxes.

Indicators of Education Systems Project (INES): INES refers to the specific office within CERI and the OECD that is responsible for producing the *Education-at-a-Glance* series of reports (*see CERI and OECD*).

Instituti magistrali: Four-year, upper secondary teacher preparatory programs at which primary school teachers in Italy receive general academic and pedagogical training.

International Assessment of Educational Progress (IAEP): See the section of this publication entitled *Sources of Data*.

IRRSAE: Regional Institutes for Research, Experimentation and Refresher Courses found in Italy. They organize the regular in-service training and development courses for teachers, focusing on subject-area knowledge and teaching practice required by law.

ISCED: International Standard Classification of Education levels. See sidebar entitled *ISCED levels of education* for additional details.

Juku: Found in Japan, these are typically private schools offering instruction to help students (typically primary and lower secondary students) get ahead in their school work and prepare for the large numbers of entrance examinations that help determine students' chances to enter particular high schools or colleges and universities. This instruction generally takes place after school and on weekends.

Labor force: Persons aged 15–64 who are either employed or actively seeking work comprise a labor force.

Land (plural = Länder): This is the German term for State.

Laurea: Italy's higher education degree, granted after 4 or 5 years of study in a university. It requires a dissertation.

Licence: One of the French higher education degrees. It is earned at the end of the first year of study after earning the DEUG and the prerequisite for admission to the next year of study leading to the Maîtrise (*see DEUG and Maîtrise*).

Lower secondary education: Education equivalent to middle/junior high school (grades 7, 8, and 9) in the United States.

Lycée: French academic high school.

Maîtrise: In France, this is the higher education degree earned after earning the DEUG and the Licence (see *DEUG and Licence*).

Migration: Geographic mobility involving a change of usual residence between clearly defined geographic units, that is, between countries, states, or regions.

Minimum-competency testing: Measuring the acquisition of competence or skills to or beyond a certain specified standard.

Monbusho: The Japanese Ministry of Education, Science and Culture.

Natural sciences: A group of fields of study which includes the life sciences, physical sciences, and mathematics.

Nonuniversity higher education: Education above or beyond the secondary school level involving programs that terminate in a less-than-4-year degree. In some systems, the programs at this level (i.e., those not leading to a university degree or equivalent) do not lead on to other programs in higher education; in other systems, such programs allow students who successfully complete their studies to proceed to university degree programs in the same field. The former is called a "terminal" program while the latter is called an "articulated" program. For example, the "Associate Degree," awarded after 2 years of study in the United States, is not regarded as a university degree for international purposes. This also applies to the *diplôme d'études universitaires générales* (DEUG) in France.

Organization for Economic Co-operation and Development (OECD): The OECD is an organization of 25 nations (as of 1995) whose purpose is to promote trade and economic growth in both member and nonmember nations. OECD's activities cover almost all aspects of economic and social policy. The member countries are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

Part-time enrollment: See *Full-time/Part-time enrollment*.

Pedagogy: The art, profession, or study of teaching.

Poverty: The "poverty line," for the purposes of this publication, is defined as 40 percent of median income. (See *Income*.)

Preprimary education: Preprimary education (public and private) may either be part-time or full-time and can cover young children participating in programs intended to foster learning and emotional and social development. Preprimary education is not compulsory in most countries. Day nurseries, childcare centers, and similar institutions that predominantly provide custodial care are not included. In some countries, it is difficult to distinguish among the various programs.

Primary education: This includes all forms of education prior to secondary education; it is equivalent to elementary education in the United States.

Private expenditures: This includes expenditures funded by private sources—mainly households, private nonprofit institutions, and firms and businesses. Private expenditures include school fees, materials such as textbooks and teaching equipment, transport to school (if organized by the school), meals (if provided by the school), boarding fees, and expenditure by employers for initial vocational training.

Private schools: Private schools are normally organized independently of the public authorities, even though they may receive a small amount of public funding.

Private schools predominantly publicly funded: These are schools that obtain most of their funding from public authorities, even though these schools are not formally part of the public school sector.

Professeurs agrégés: Upper secondary level teachers in France. Distinguished from professeurs certifiés according to their degrees. Professeurs agrégés hold the agregation certificate.

Professeurs certifiés: Upper secondary level teachers in France. Distinguished from professeurs agrégés according to their degrees. Professeurs certifiés hold one of the the following certificates: Certificat d'Aptitude au Professorat de l'Enseignement du Second Degré (in arts and sciences), Certificat d'Aptitude au Professorat de l'Enseignement Technique (in technical education), or Certificat d'Aptitude Professionnelle de l'Education Physique et Sportive (in physical education).

Public expenditures: These are expenditures funded by public authorities at all levels. Expenditures on education by public agencies other than education departments, ministries, or boards are included. Expenditures of education departments, ministries, or boards that are not directly related to education are generally not included.

Public schools: Public schools are organized by public authorities. They normally provide open access without any distinction of race, sex, or religion.

Purchasing Power Parity (PPP) index: The PPP index is composed of the rates of currency conversion that equalize the purchasing power of different currencies. This means that a given sum of money, when converted into different currencies at the PPP index rates, will buy the same basket of goods and services in all countries.

Realschule: Germany's middle school, grades 5–10 for those planning on entering higher education.

Scholastic Aptitude Test (SAT): An examination administered by the Educational Testing Service and used to predict the facility with which an individual will progress in learning college-level academic subjects.

Schulkindergarten/Vorschulen: In Germany, these are preschool classes for children who are of school age but not yet ready for school.

Scuole materne: Italian nursery school.

Sources of funds: The origins of education expenditures can be found among the several levels of government and between public and private sources. Further, the initial sources of money for education sometimes differ from the ultimate spender. For example, though local school districts in the United

States generally operate and fund the local public schools, much of the financing arrives in the form of transfers from state governments. Some of the state money, in turn, arrives in the form of transfers from the federal government. The initial source of those transferred funds, then, are state and federal governments. Moreover, the initial source of funds spent on public schools can be public or private. Student tuition and fees are one example of a private source of public expenditure. Funding by private firms of youth apprenticeship programs in Germany is another example. Likewise, the initial source of funds spent on private schools can be public or private.

Special education: Direct instructional activities or special learning experiences designed primarily for students identified as having exceptionalities in one or more aspects of the cognitive process or as being underachievers in relation to general level or model of their overall abilities. Such services usually are directed at students with the following conditions: (1) physically handicapped; (2) emotionally handicapped; (3) culturally different, including compensatory education; (4) mentally retarded; and (5) learning disabled. Programs for the mentally gifted and talented are also included in some special education programs.

Standard error: An estimate of the sampling error of a reported mean, proportion, or other statistic, based in part on the number of observations. Ordinarily, the larger the sample is, the smaller the error will be. There are several techniques used in estimating standard errors, including jackknifing and bootstrapping.

Student: An individual for whom instruction is provided in an educational program under the jurisdiction of a school, school system, or other education institution. A student may receive instruction in a school facility or in another location, such as at home or in a hospital. Instruction may be provided by direct student-teacher interaction or by some other approved medium such as television, radio, telephone, and correspondence.

Studentenwerk: A federally funded organization in Germany that oversees university student housing, meal services, and financial aid.

Student/teacher ratio: The enrollment of students at a given period of time, divided by the full-time-equivalent number of classroom teachers serving these pupils during the same period. Student-teacher ratio reflects teacher workload and the availability of teacher services to students. However, this measure differs from class size. The relationship between the two is affected by a variety of factors, including the number of classes for which a teacher is responsible and the number of classes taken by students.

Unemployment rate: The percentage of the labor force without work, actively seeking work, and currently available for work yields the unemployment rate.

University: University education is defined here as education leading to a 4-year undergraduate degree or graduate degree.

Upper secondary education: This is a level of education equivalent to grades 10, 11, and 12 in the United States. Upper secondary education may include general, technical, or vocational education.

Vocational education: Organized educational programs, services, and activities that are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career requiring other than a baccalaureate or advanced degree.

Vorklassen: In Germany, these are preschool classes with special emphasis on preparation of 5-year-olds for school (in some Lander only).

Yochien: Japanese kindergarten.

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